OCT 3 1 1923

PERIODICAL ROOM GENERAL LIBRARY UNIV. OF MICH.

Journal of Educational Research

OFFICIAL ORGAN OF THE
EDUCATIONAL RESEARCH ASSOCIATION

B. R. BUCKINGHAM, EDITOR

ASSOCIATE EDITORS

E. J. ASHBAUGH W. W. CHARTERS GEORGE D. STRAYER
GUY M. WHIPPLE S. A. COURTIS LEWIS M. TERMAN
HARRY A. GREENE

VOL. VIII SEPTEMBER, 1923 No. 2

CONTENTS

		Page
A STUDY OF THE VALIDITY OF THE COURTIS AND STUDE-BAKER PRACTICE TESTS IN THE FUNDAMENTALS OF ARITHMETIC	W. J. Osburn	93
WHAT RESEARCH CAN DO FOR THE SUPERINTENDENT	Jesse H. Newlon	106
AN EXPERIMENT IN VARYING METHODS OF TEACHING BRIGHT AND DULL SECTIONS OF THE SEVENTH GRADE	Emma D. Bush	113
A STUDY OF TEN GIFTED CHILDREN WHOSE SCHOOL PROGRESS WAS UNSATISFACTORY	Dorothy VanAlstyne	122
THE USE OF AMERICAN TESTS TO MEASURE ENGLISH TEACHING IN CHINA	Sterling G. Brinkley	136
YEARS IN SCHOOL AND ACHIEVEMENTS IN READING AND ARITHMETIC	Chas. L. Harjan	145
THE STANFORD-BINET TESTS IN SOME ENGLISH SCHOOLS	P. L. Gray and R. E. Marsden	150
EDITORIALS		156
REVIEWS AND ABSTRACTS		165
NEWS ITEMS AND COMMUNICATIONS		174

Entered as second-class matter at the Post Office at Bloomington, Illinois under the act of March 3, 1879.

Journal of Educational Research

Copyright 1923, by
Public School Publishing Co.

Official Organ of the Educational Research Association

Editor-in-Chief, B. R. Buckingham
Director of Bureau of Educational Research, Ohio State University, Columbus, Ohio

Associate Editors

E. J. ASHBAUGH, *Ohio State University, Columbus.*

W. W. CHARTERS, *Carnegie Inst. Tech., Pittsburgh.*

S. A. COURTIS, *City Schools, Detroit, Mich.*

HARRY A. GREENE, *Ex-Officio, Secretary Educational Research Association, State University of Iowa, Iowa City.*

GEORGE D. STRAYER, *Teachers College, Columbia University, New York City.*

LEWIS M. TERMAN, *Leland Stanford Junior University, Stanford University, California*

GUY M. WHIPPLE, *University of Michigan, Ann Arbor, Michigan.*

Contributing Editors

VIRGIL E. DICKSON, *Director, Bureau of Research and Guidance, Public Schools, Oakland and Berkeley, California.*

CHARLES FORDYCE, *Director of Bureau of Educational Measurements, University of Nebraska, Lincoln, Nebr.*

M. E. HAGGERTY, *Dean of the College of Education, University of Minnesota, Minneapolis.*

V. A. C. HENMON, *Director, School of Education, University of Wisconsin, Madison.*

ARTHUR W. KALLOM, *Assistant Director, Department of Educational Investigation and Measurement, Public Schools, Boston, Mass.*

P. J. KELLY, *Dean of University Administration, University of Kansas, Lawrence, Kans.*

ROBT. H. LANE, *Assistant Superintendent of Schools Los Angeles, Cal.*

WILLIAM A. McCALL, *Assistant Professor of Education, Teachers' College, Columbia University.*

GEORGE W. MELCHER, *Director, Bureau of Research and Efficiency, Public Schools, Kansas City, Missouri.*

EUGENE A. NIFENECKER, *Assistant Director, Bureau of Reference, Research and Statistics, Public Schools, New York City.*

JOSEPH P. O'HERN, *Assistant Superintendent of Schools and Director of Efficiency Bureau, Public Schools, Rochester, New York.*

LEON. O. SMITH, *Assistant Superintendent (in charge of Educational Research) Public Schools, Omaha, Nebraska.*

W. W. THEISEN, *Assistant Superintendent of Schools Milwaukee, Wis.*

CLIFFORD WOODY, *Director Bureau of Tests and Measurements, University of Michigan, Ann Arbor, Mich.*

The JOURNAL OF EDUCATIONAL RESEARCH is published at Bloomington, Illinois, monthly, except July and August by the Public School Publishing Co. The subscription price is $4.00 $4.30 in Canada or Mexico, and $4.50 in other foreign countries.

The editorial office is at Columbus, Ohio. Address all communications on editorial matters to B. R. Buckingham, Director of Bureau of Educational Research, The Ohio State University, Columbus, Ohio.

Subscriptions and all communications about reprints or other business matters should be addressed to the Public School Publishing Company at Bloomington, Illinois.

JOURNAL *of* EDUCATIONAL RESEARCH

Volume VIII SEPTEMBER, 1923 Number 2

A STUDY OF THE VALIDITY OF THE COURTIS AND STUDEBAKER PRACTICE TESTS IN THE FUNDAMENTALS OF ARITHMETIC

W. J. OSBURN

State Department of Public Instruction, Madison, Wisconsin

If a practice series is to be valid it must conform to the following requirements: (1) it should cover all of the field which it claims to cover; (2) it should afford practice which is proportional in amount to the difficulty of the several associations which are to be formed; (3) it should afford additional practice upon those associations which are of relatively greater social importance.

If a pupil is to attain mastery of the fundamentals of arithmetic, he must be able to respond correctly to each of the following 1470 combinations: (1) one hundred principal combinations in addition; (2) one hundred principal combinations in subtraction; (3) one hundred principal combinations in multiplication; (4) four hundred and fifty combinations in short division, including the cases where there are remainders; (5) seven hundred and twenty higher decade additions. (This does not include the zeros of the higher decades nor anything above the ninth decade).

SOURCES OF ERROR

For some years a feeling had been growing in Wisconsin that the results obtained in the fundamentals of arithmetic were not what they should be. Surveys made previous to 1920 had tended to strengthen this feeling and had shown that the general level of achievement was not rising. A detailed study of the situation was felt to be necessary. Accordingly, another survey of the

fundamentals of arithmetic was made with additional plans calling for the listing of all wrong answers which occurred more than once in any school. Returns were received involving about 21,000 errors which were analyzed and classified. In addition, it was found that 8 percent of the errors were due to mistakes in carrying while more than 25 percent were due to errors in the combinations. In subtraction, difficulties connected with bridging were responsible for 40 percent of the errors while zero difficulties caused 20 percent. In multiplication, ignorance of zero combinations was to blame for 5 percent of the errors, while almost 50 percent were due to inaccuracies with the fundamental processes. Zero troubles in division accounted for 13 percent of the errors while 43 percent of the trouble was due to errors in the several combinations.

The causes of inaccuracy are of four types for the most part. First, the wrong responses may be due to innate weaknesses in the neurone structure of the children themselves. Second, the method and order of presentation may be faulty. Third, the amount of drill on the particular elements may not be in proportion to the difficulty of the elements. Fourth, some of the elements may even be omitted from the drill exercises.

The Method of Analysis

The purpose of this paper is to discuss the third point somewhat in detail. Are pupils receiving drill in proportion to the difficulties which they encounter? In order to answer this question at least in part, the writer made an analysis of one set of each of the two practice tests which are in most general use in Wisconsin and elsewhere. These were the Courtis Practice Tests, Series A and the Studebaker Practice Exercises, Set B. Each series was reviewed carefully from beginning to end and a count was kept of the number of times each number fact occurred. Each of the problems in compound multiplication and long division was worked out and a count was made of the addition, subtraction, multiplication, and division combinations as they occurred.

In order to make such a count, certain assumptions were necessary. They are as follows so far as this study is concerned: 1. It was assumed that all addition is made from the bottom of the column *upward*. 2. When carrying is involved it was assumed that the amount carried was to be added in *at the beginning* of the next column. 3. In multiplication where carrying is involved it was assumed that the amount carried was added as a higher decade addition. For example, in the case of $\begin{array}{r} 53 \\ \times\ 5 \end{array}$ it was assumed that the addition involved is 25 and 1 rather than the reverse. 4. In the case of "borrowing" it was assumed that the one which was borrowed was added to the next figure in the subtrahend. 5. In case addition was presented in the equation form it was assumed that the direction of the addition was from *left to right* unless it was necessary to recopy the numbers. In the latter case it was assumed that the first number on the left was written at the top of the column. 6. The simple division facts which the child uses in estimating the quotient in long division were counted even though the first estimate might be wrong. For example, in the exercise $49\overline{)1274}$ a count was given to $12 \div 4$.

Variation in Drill

With these assumptions in mind the count was made. Tables I to IV show the results. Throughout this article Test A means the Courtis Practice Tests, Series A; Test B, the Studebaker Practice Exercises, Set B. Table I (line 3) reads, "The number of combinations in addition presented four times was 1 for Test A and 3 for Test B."

The total number of facts given in Table IV is 450, because there are 450 facts which a child must know in order to do short division including all cases where remainders occur. These combinations range from $0 \div 1$ to $89 \div 9$.

The most striking thing shown in Tables I to IV is the extreme variation which occurs. Thus under Test B in Addition, the number of presentations ranges from two to ninety-two. The

TABLE I. ADDITION

Presentations	Frequency of Combinations	
	Test A	Test B
2		2
3		3
4	1	3
5	2	5
6	1	3
7	6	0
8	0	1
9	7	2
10	2	2
11	3	0
12	4	6
13	4	9
14	10	9
15	6	7
16	12	4
17	6	7
18	2	4
19	5	5
20	4	3
21	8	4
22	0	3
23	4	3
24	2	2
25 and over	11	13
Total	100	100

TABLE II. SUBTRACTION

Presentations	Frequency of Combinations	
	Test A	Test B
0		3
1		1
2		1
3		5
4		1
5	3	2
6	1	4
7	8	9
8	12	10
9	8	7
10	11	11
11	6	11
12	14	7
13	5	7
14	9	2
15	5	4
16	5	3
17	3	0
18	5	3
19	0	1
21	0	1
23	2	0
24	0	1
25 and over	3	6
Total	100	100

same is true to a less extent of each of the following tables. If plotted the shape of the distribution in each case would approach that of the normal curve. In the case of division the amount of drill is much less and most of the combinations do not occur at all.

Now, what can be the reason for such peculiar results? Is it true that in the case of addition, subtraction, and multiplication there are a few combinations which are extremely difficult and a few which are extremely easy while the great majority are of medium difficulty? In division, is it true that over half of all the combinations are either a portion of the child's biological inheritance or else so easy that no practice whatever is needed upon them?

Relation Between Difficulty and Opportunity for Drill

Quite definite information is available concerning the relative difficulty of nearly one half of the principal combinations in addition and multiplication. It seems reasonable to suppose that simi-

TABLE III. MULTIPLICATION

Presentations	Frequency of Combinations	
	Test A	Test B
1		6
2		5
4	1	4
5	0	3
6	0	4
7	0	2
8	0	3
9	0	3
10	2	3
11	2	4
12	5	2
13	2	5
14	4	1
15	5	8
16	14	1
17	10	5
18	1	6
19	8	3
20	8	7
21	5	4
22	4	2
23	3	4
24	5	3
25 and over	11	2
Total	90*	90*

TABLE IV. DIVISION

Presentations	Frequency of Combinations	
	Test A	Test B
0	251	235
1	77	119
2	33	63
3	31	16
4	17	11
5	12	5
6	9	1
7	6	
8	5	
9	4	
10	3	
11	1	
12	1	
Total	450	450

lar variations in difficulty exist among the corresponding combinations in subtraction and division. The best and most reliable source for this information is Holloway's pamphlet entitled, "The Relative Difficulty of the Elementary Number Combinations." No one else, so far as the writer can learn, has ever made a similar study with children *who had previously had the same amount and kind of drill.* Holloway's results show that in general the addition combinations which involve bridging are the most difficult and that the difficulty distribution is not normal in type. No account of these facts was taken, however, by the writers of the two tests under consideration here. In both tests the average amount of practice upon combinations which require bridging is less than the average of all the combinations. The exact figures are given in Table V.

Thus it is evident that more practice is being given to that which is easy and less to that which is difficult. When individual

* Zero multipliers not included.

TABLE V. DRILL ON COMBINATIONS WITH AND WITHOUT BRIDGING

	First Decade Addition		Subtraction	
	Test A	Test B	Test A	Test B
Average drill when there is no bridging (presentations)	19.3	19.2	13.5	13.5
Average with bridging (presentations)	16.3	17.8	10.8	9.0
General average (presentations)	17.9	18.6	12.3	11.5

combinations are considered the situation is still worse. The full data from which Tables I and II were constructed show that the two ranges are as given in Table VI. It is evident that this variation does not coincide with that of the difficulties. Why have, for example, more than six times as much drill on 10 less 6 as is given to 10 less 2?

TABLE VI. RANGE OF FREQUENCY OF OCCURRENCE FOR ALL COMBINATIONS AND FOR THOSE INVOLVING BRIDGING

	All Combinations		Combinations Involving Bridging	
	Addition	Subtraction	Addition	Subtraction
Test A	4 to 62	5 to 32	9 to 26	7 to 17
Test B	2 to 92	0 to 47	12 to 37	3 to 19

In multiplication Holloway's results show that almost without exception combinations whose products exceed 25 are more difficult than those whose products are 25 or less. The relative amount of drill upon the easy and difficult combinations in terms of averages is given in Table VII.

TABLE VII. DRILL ON EASY AND HARD COMBINATIONS IN MULTIPLICATION

	Test A (presentations)	Test B (presentations)
Average for combinations whose products exceed 25	18.3	20
Average for those whose products are 25 or less	16.4	7.3
General average	17.1	11.83

The ranges for the drill upon all combinations in multiplication are for Test A, 4 to 40 presentations, and for Test B, 0 to 27 presentations. The corresponding ranges for the drill upon the

more difficult problems are: Test A, 13 to 25 presentations; Test B, 17 to 25 presentations. So far as multiplication is concerned it is possible that some attention may have been paid to additional drill upon the difficult combinations.

It should be remembered, of course, that in addition and subtraction there is necessarily a large amount of over-learning on the combinations involving one. This is due to carrying and borrowing, and, of course, tends to increase average drill upon the easier combinations. But even when these combinations are omitted from the count the correlations between difficulty and amount of practice afforded are all negative save one.

Zero Combinations

A serious type of error originates in connection with the zero combinations. The averages of Table VIII show how drill upon the zeros has been neglected.

TABLE VIII. DRILL ON ZERO COMBINATIONS

	Addition		Subtraction		Multiplication	
	Test A	Test B	Test A	Test B	Test A	Test B
Average drill upon zero combinations (presentations).....	9.7	6.5	6.7	2.9	11.1*	5.3*
General average (presentations).....	17.9	18.6	12.29	11.47	17.1	11.83

*Zero multipliers are not included.

Higher Decade Additions

It is well known that some practice is needed upon the higher decade additions. If a child knows how much 9 and 8 are, for example, it does not follow that he will know the sum of 29 and 8. The total number of the higher decade additions is nine hundred. To give special drill upon all of them would require a large amount of time and energy. Ordinarily some selection will have to be made. In making such a selection, a few obvious facts should be kept in mind. 1. Little or no practice will be needed on the higher decade additions of the type 38 and zero. The child meets this type only in column addition where zeros

occur some distance up the column (upward addition is assumed). In such cases the child soon learns merely to omit the zeros. There are ninety combinations of this type. 2. The higher decade additions, which occur in both multiplication and addition, are in general more important than those which occur in addition alone. There are 175 of these. 3. The higher decade additions which involve bridging are more difficult than those which do not. Four hundred and fifty of them involve bridging. 4. The social importance of the higher decade additions decreases markedly as one goes from the second decade upward. (This statement is subject to the reservations indicated under 2 above).

With these facts in mind, it is evident that a good practice series will meet the following requirements. 1. Much practice will be given in lower decade addition and relatively little in the ninth and tenth decades. 2. Combinations involving bridging should in general receive more practice. 3. Combinations which are used in both multiplication and addition should receive additional drill. 4. Combinations involving both of the last two points should receive most attention.

How do the tests under consideration meet these standards? Summarizing a series of highly detailed findings, the facts of Table IX may be presented. In this table zero combinations are not considered. Those of the ninth and tenth decades are omitted because of their lack of social importance.

Table IX shows that the amount of drill is greatest in the second and third decades and decreases thereafter. But this de-

TABLE IX. DRILL IN HIGHER DECADE ADDITION

	Test A			Test B		
	Decades 2 and 3	Decades 4 and 5	Decades 6 to 8 inclusive	Decades 2 and 3	Decades 4 and 5	Decades 6 to 8 inclusive
Number of possible combinations	180	180	270	180	180	270
Number presented	168	161	109	180	162	110
Number not presented	12	19	161	0	18	160
Average number of presentations	5.8	2.5	0.7	8.1	3.4	0.8

crease is greatly overdone, since in Test A, 182 combinations do not occur at all while in Test B the number of missing combinations is 178.

Consider now the amount of drill given upon higher decade addition which involves bridging. The average drill upon such combinations is given in line (b) of Table X. Line (a) gives the general average. Evidently no additional drill is given on the combinations involving bridging. As a matter of fact 134 of these combinations are entirely missing in Test A, and 150 in Test B.

What attention has been paid to the higher decades that are used in both multiplication and addition? Table X likewise—

TABLE X. DRILL ON IMPORTANT CLASSES OF HIGHER-DECADE ADDITION COMBINATIONS

	Test A (presentations)	Test B (presentations)
(a) General average	2.7	3.8
(b) Average when bridging is involved	1.9	2.4
(c) Average on combinations used in multiplication and addition	4.4	6.2
(d) Average on combinations involving bridging and used in multiplication and addition	3.9	5.3

line (c)—offers an answer to this question. These averages look encouraging, but an inspection of the distribution of practice (not reproduced here) shows that in Test A nine of these important combinations are entirely missing while in Test B six fail to appear. Thus the favorable looking averages arise from a condition that is still far from satisfactory.

There are sixty higher decade additions which are used in both addition and multiplication and which also involve bridging. These are undoubtedly very important and should be drilled upon extensively. Line (d) of Table X shows the average amount of drill on these combinations. It evidently exceeds the drill given in general to all combinations. Again, however, the fact that the averages for these important combinations is above the general average does not tell the whole story. The actual

range of drill is from 0 to 14 for Test B and from 0 to 12 for Test A.

Practice in Division

Three points in regard to drill in division remain to be considered. The first one relates to the amount of drill upon combinations in which there is a zero quotient with or without a remainder. This question is a very troublesome source of error. It is exemplified in the following problem: $6\overline{)1218}$. The pupils get an answer 23 because they do not respond to the situation $1 \div 6 = 0$ with a remainder of 1. The distributions given in Table XI show how poorly the tests meet the needs on these 45 combinations.

TABLE XI. DISTRIBUTION OF DRILL ON COMBINATIONS INVOLVING ZERO QUOTIENTS

Presentations	Frequency	
	Test A	Test B
0	27	29
1	7	14
2	2	2
3	3	
6	3	
7	1	
8	1	
9	1	
Total	45	45

Table XI reads "The number of combinations not presented at all was 27 for Test A and 29 for Test B; the number presented once was 7 for Test A and 14 for Test B; etc."

The second point concerns the question of bridging in relation to short division. Cases like $51 \div 6$ where the child must think 48 and then subtract the 48 from 51 are the ones under consideration here. There are one hundred situations of this sort. The distribution of practice upon them is given in Table XII. These are undoubtedly difficult combinations, and the amount of drill afforded them is entirely inadequate.

A final point has to do with the question of order. It is impossible to take up this question in detail. It is worth while,

TABLE XII. DISTRIBUTION OF COMBINATIONS INVOLVING BRIDGING IN SHORT DIVISION

Presentations	Frequency	
	Test A	Test B
0	84	66
1	12	24
2	2	8
3	2	2
Total	100	100

however, to consider it here in reference to long division. It is a principle of long and recognized standing that drill should proceed from simple to complex. Long division is generally known as a difficult unit of subject matter. It is especially necessary therefore to be sure that no principles of teaching are being violated in the order of its presentation. The simple problems should precede the more complex, but before this is possible the simple and complex problems must be identified. The criterion for such identification has hitherto been very vague. The extensive analysis of errors which preceded this study furnishes evidence which helps to make this criterion much more definite because it helps to center attention upon the difficulties involved. The error study shows the following to be troublesome in long division: bridging, carrying, estimating the quotient, and the zeros in either divisor, dividend or quotient. Now, there are 329 simple problems, involving only two digits in the divisor and two in the quotient, which contain none of these difficulties. Obviously these should be presented first. Then the difficulties should be presented one at a time, two at a time, three at a time, and four at a time. This rests upon the assumption that two difficulties combined are more difficult than each one taken separately and that a combination of all four difficulties is most difficult of all. This assumption needs further verification but the evidence at hand shows that it is not far from the truth. It now remains to see how these principles have been observed in Tests A and B.

For Test A the situation is as follows: In the first test of long division most of the problems are of the simplest type. Five of them involve carrying however. The second test involves only the zeros as an additional difficulty. The third test

contains three exercises which involve both carrying and bridging, four with carrying only, one with bridging only and two with carrying and zeros. The first problem in which the trial quotient is not the true quotient occurs as No. 1 in the fourth test. It contains all of the major difficulties. Thus a very difficult new situation is introduced under the worst possible conditions for problems with two digits in the divisor and two in the quotient. Test four also includes the exercise $79\overline{)6399}$. This is one of a class of 720. Now the usual method in such a case is to instruct the child that if he calls the seven an eight, the trial quotient will probably be the true one. This method is dependable in more than 90 percent of the cases. More exactly it works in 665 possible cases and fails in only 55. Why should the child meet with the *exception* to the rule at the very beginning of his experience? Evidently it is possible to improve the order in which these exercises are presented.

For Test B the facts are as follows: In the first test of long division both bridging and zero combinations are present. In the first and fifth exercises and in the second and third exercises carrying is involved while the fourth contains both bridging and carrying.

The second test contains three problems in which the trial quotient is not the true quotient. This difficulty occurs in nearly every case in conjunction with at least two of the other difficulties. In the first exercise involving a trial quotient which is not the true quotient, all three of the other difficulties are present. Not one of the 329 simple problems is given anywhere in the whole series. The goddess of chance was surely unkind to the author of this test.

Summary and Conclusions

1. The purpose of this study was to find out whether or not the pupils who use these tests could obtain adequate drill from them to meet the difficulties which are known to exist.

2. These difficulties may be classified roughly as follows: inaccuracies with the fundamental number facts and particularly,

trouble with the zero combinations and with those involving bridging.

3. Based upon certain necessary assumptions, an actual count was made showing the frequency of occurrence of each of the 1470 combinations, grouped according to operations.

4. The results show that the number of times which each of the various combinations occurs varies from 0 to 92.

5. There is a pronounced tendency to give too much practice to the easy combinations and too little to those which are difficult. This is true even when combinations like $+\frac{6}{1}$ and $+\frac{1}{4}$ and $5 - 5$ are not considered. Even without these combinations the correlation between the difficulty of the number facts and the amount of drill given to them is negative, with the exception of Test B, Multiplication.

6. Drill upon the zero combinations has been seriously neglected.

7. Of the 1470 number associations which a child must possess to attain a mastery of the fundamentals, at least 500 do not occur in these tests at all. Thus each test covers less than two-thirds of the total field.

8. The practice which is afforded in short division with remainders and in higher decade addition is particularly inadequate.

9. Not enough attention has been paid to the relative social importance of the higher decade additions.

10. The principle of "simple to complex" has been violated in long division and particularly so in the case of Test B.

Both tests have been of tremendous value to the teaching of arithmetic and it is not the purpose of this article to detract one iota from the credit of their authors. These men did very valuable pioneering but their achievement is far from perfect. The time is surely at hand when an improvement upon their work should be forthcoming.

WHAT RESEARCH CAN DO FOR THE SUPERINTENDENT[1]

JESSE H. NEWLON
Superintendent of Schools, Denver, Colorado

The greatest problem that confronts democracy is the organization of research. At an earlier period in the history of the race, progress was made solely by the trial and error method, but in the future we must depend more and more on research in every field of human endeavor if civilization is to continue to advance.

As yet the people are not conscious of the necessity of extending and organizing more effectively research activities. In the bewildering complexities of contemporary life it is impossible for a statesman or an executive to form sound judgments on important social, political, and economic problems until there have been placed before him the facts that have been gleaned by research and marshalled into understandable array. An informed public opinion can be based only on the results of careful investigations that have been carried on by experts in every field of knowledge. Furthermore, sound public opinion is dependent quite as much on an intelligent marshalling of the results of research as upon the research itself. One of our most difficult educational problems is to bring the people to a realization of these facts.

Educational research is necessary to create a school system adapted to the needs of the individual and of society, but we have only made a beginning in educational research. Up to the present time educational research has been desultory in character. Here and there important discoveries have been made; here and there are centers doing excellent work; but the whole field of education has never been thoroughly covered and the efforts of research workers have not been properly coordinated. Larger sums of money must be invested in research. It must every-

[1]Read before the Educational Research Association, Cleveland, March 1, 1923.

where be divested of anything savoring of a commercial enterprise. It must be carried systematically into every nook and corner of the field of education.

The superintendent of schools who is responsible for making recommendations of policies to boards of education does not often find that he can base his recommendations on sound research. Occasionally an authoritative study is at hand but in most fields in which the superintendent works he does not have the benefit of such studies. Research activities have been too meagre and too scattering.

Strictly speaking, the gathering, compiling, and distributing of statistical information regarding the schools is not research; but this work is very much akin to research, and many of the members of your association are engaged chiefly in work of this character. Such work is indispensable to the proper conduct of schools. But every school statistician knows how inadequately the work is done. Statistics relating to school systems are still haltingly collected and disseminated. Because of varying conditions as regards laws relative to valuation, taxation, and kindred subjects, and because of the lack of a definite educational terminology, most of the data collected must be subjected to critical analysis and interpretation before they can be used, and frequently the director of research in a given system does not have at hand the facts necessary for such critical analysis and interpretation.

Time will permit of but two or three illustrations of present conditions and needs. Notwithstanding a quarter of a century of study of financial problems and notwithstanding the most useful work done by the United States Bureau of Education, the superintendent is still without adequate information upon which he can base recommendations in the field of finance. Due to improved systems of budgeting and accounting, he has immeasurably more of useful information than he could have had ten years ago, but he is still without much of the information that he ought to have. The Finance Inquiry which is being carried on at present is a step in the right direction and is an example of the type of investigation that should be carried on along

many other lines. But the Finance Inquiry should have had at its disposal two or three million dollars instead of the limited resources which it has. In the present chaotic condition of affairs the superintendent has no standard by which he can compare the tax burden in his city with the tax burden in other cities and no competent standards for comparing costs in his city with costs in other cities.

Methods of showing costs in terms of educational results largely remain to be developed. For example, a given city is spending a certain amount of money annually on kindergartens, or art education, or the teaching of mathematics. The question is, how do the results obtained compare with the results obtained by similar expenditures in other cities, and do the results justify the cost? The development of educational tests is a beginning in this direction, but these tests are as yet very limited in their uses. They can never measure statistically all the results of education. But the mounting costs of education demand a cost accounting far more detailed and intelligible than anything which has yet been attempted in educational administration. The procedure of such accounting must be worked out by those who are engaged in educational research.

Again, supervisory officers in our school systems must master the technique of making the results of research usable by the teacher in the schoolroom. The first step towards improvement in this direction must be the translation of results of research into more intelligible language, and of that I shall speak again. The second step must be to educate supervisory officers in the elementary principles of research and to familiarize them with the results of research in given fields. We need more compendiums such as were made recently by the Committee on the Economy of Time in the compilation of the results of discoveries in teaching certain skills and subjects such as handwriting and reading. Results must be made more readily available for use in the classroom.

Recently Dr. Thomas H. Briggs set a magnificent research problem for makers of curricula. Dr. Briggs says:

"When these or similar principles are accepted, one is ready for the third major step in the procedure, the making of an inventory, as comprehensive as possible, of the knowledge, attitudes, ideals, prejudices, acts, and habits desirable in citizens of a democracy. Beginnings of such inventories have here and there been made in special fields, such as spelling and arithmetic; but consideration needs to be given to all phases of living. Certainly we must record desirable personal relations, cooperative effort for commonly desired ends, and the like as extensively and as thoroughly as we have in the past the details of the logical organization of the academic subjects. . . . .

"The fourth step in the procedure toward a better curriculum is a tentative selection from the inventoried details of those for teaching. This would involve, first of all, the selection of those for which the schools assume responsibility, leaving the others to the home, the church, or to other agencies likely to be effective. To the retained details must then be assigned relative values. This task is another one that demands common-sense decisions, since we lack definitive criteria. And from the evaluated details one must choose those most likely to be of value to local as well as to larger social units."

Time will not permit me to quote Dr. Briggs further, but in my judgment he has stated the big task in curriculum-making, and this task presents a research problem which will demand herculean labors and which must be attacked by school systems throughout the country. With school systems at work upon this problem there will be need of great national commissions to coordinate the work of the country as a whole, commissions modeled somewhat after the Finance Inquiry Commission, and commissions adequately financed.

To date, with a few shining exceptions here and there, research has been carried on chiefly by universities and private foundations; and there are those who contend that research is not a proper function of a school system. However, a survey of American education in the past twenty-five years will show a surprising number of instances of successful experimentation within school systems. The Gary Schools have, for example, made a notable contribution to American education. This experimentation must be carried on in every large school system in America. In fact, in a measure, every school must become a center of research. In Denver we have designated an elementary school as the "curriculum school," and in this school we propose

to carry on experiments in curriculum-making and in methods of teaching as well. The Lincoln School of Teachers College is the most promising experiment in American education today. This experiment should be extended to involve a larger number of pupils and carried on under more nearly ordinary public-school conditions. While no city can hope to find the funds and public support necessary to parallel the detailed experimentation that is being done in the Lincoln School, most of the large cities can carry out a type of experimentation of a less detailed character, which will nevertheless prove most fruitful. Again, the public schools must provide testing grounds in which to try out tentative conclusions reached in such institutions as the Lincoln School.

Research must be made of more practical value to the classroom teacher. At present the teacher confronts a chaotic body of literature—good, bad, and indifferent—bearing upon his problem. In this great mass of material there are a few grains of truth that have been discovered by the researchers. This vast body of material must somehow be sifted and the truths in it brought to light, organized, and pointed in such a way that the teacher may make the most effective use of them.

The research department of the public schools must, to a large extent, be the eyes and ears of the superintendent. The superintendent cannot make his own researches. Only to a limited degree can he see the conditions in the schools first hand, and even where he can view conditions personally he must have the aid of eyes and ears better than his own. There should come to his table regularly reports showing vividly and accurately conditions in every department of the school system. If this is to be done, three conditions must be met. 1. Communities must be willing to appropriate to the department that directs and largely carries on the research activities in the schools more money than has been spent up to the present time. 2. More men and women must be trained for research. 3. Better methods of presenting the results of investigations and research must be devised. I refer here not so much to the actual visual presentation of material as to the organization of the facts to be presented and systems of

presenting them regularly and comprehensively. I refer chiefly to the collection and presentation of statistical data described in a previous paragraph.

May I add another condition which will imply a criticism of some of the research work that has been done in the field of education? Researchers in this field must cultivate to a higher degree ability to hold judgment in suspense until all the evidence is in. We have made a remarkable advance in educational theory and practice in this country in the past twenty-five years, but the superintendent who is endeavoring to gain public support for a forward-looking educational program in a large city is constantly confronted with reminders of rainbow promises which have been held out by school men at various times—promises that have sometimes proved to be utterly empty. We are too prone to be carried away by the new thing. Just now the intelligence tests are attacked by the type of criticism that they should have had from their friends from the first, friends who, because of inability to hold final judgment in suspense and a lack of technique in presenting results, claimed too much without intending to do so, and have been unwittingly led into a false situation. The result is that today superintendents and other school executives are confronted by adverse critics and enemies of the intelligence tests on the one hand, and by those who claim altogether too much for these tests on the other hand, with the result that their use is fraught with many difficulties which ought never to have arisen.

In conclusion, I should like to emphasize what I consider are the two most important needs in the field of educational research. The first is that students of research should devise better methods of presenting their results. The hiatus between the research man and the profession is altogether too wide. I recognize the fact that you must speak a language which those who are not trained in your field will frequently be unable to understand. I realize that only by the use in many instances of complicated mathematical formulae, understood only by statisticians who have had the requisite training in mathematics, can research

be carried forward. One of your most pressing problems and one of which you seem not always to be aware, is to translate the results of research into a language that can be understood by those who cannot hope to master this field. For example, the superintendent of schools and the classroom teacher have a great body of knowledge to master in their respective fields. They cannot be experts in the field of research, although they are the daily users of the discoveries of research. It is imperative, therefore, that these results be translated into a language which they can understand. At present it is impossible for them to read half of the articles that come from the pens of research workers. All such technical literature bearing on these problems should be translated into more popular terms. John Dewey stated recently that educational practice lags at least twenty years behind educational theory. This is partially due to the fact that the results of educational research are not put into a form that is intelligible to the rank and file of the profession.

Finally, research must be built up on a sound educational philosophy. Based on a wrong philosophy, educational research can wreck America. Much of the controversy that arises over the use of intelligence tests is due to the fact that some psychologists are not sufficiently well grounded in the humanities, literature, history, and philosophy, and have not kept in close touch with the application of scientific methods to the social sciences, history, sociology, psychology, and economics. Such a background is necessary to give the proper perspective. In other words, the research worker must not only see life minutely but must see it whole. If he loses his social perspective he becomes a menace.

You who are engaged in educational research hold the key to educational progress. I salute you!

AN EXPERIMENT IN VARYING METHODS OF TEACHING BRIGHT AND DULL SECTIONS OF THE SEVENTH GRADE

EMMA D. BUSH
Pottstown, Pennsylvania

This experiment was conducted in a day school for girls located in one of the older cities of the South. The school had two hundred and seventy pupils drawn from well-to-do families. Nearly all the children in the seventh grade came from homes of culture and refinement and therefore had some background for their school work, though they showed a certain lack of intellectual curiosity and keenness. The subjects with which the experiment was concerned were English history and the Geography of Europe.

The time given to the history and geography was two daily consecutive periods of forty minutes each. This arrangement made it possible to mingle the two subjects and to vary from day to day the amount of time given to each. The class was divided into two sections on the basis of intelligence quotients obtained by the use of the Stanford Revision of the Binet-Simon Intelligence Test as is shown in Table I. The chronological age

TABLE I. MEMBERS OF THE CLASS

A SECTION		B SECTION	
Name	I. Q.	Name	I. Q.
M. D. C.	138	A. P.	121
A. B. G.	137	M. J.	115
M. L.	131	E. B.	115
L. W.	127	E. G.	107
M. C.	120	V. N.	104
E. H.	116	A. B.	102
N. W. F.	116	V. T.	101
J. S.	114	L. W.	99
J. R. V.	113	K. C.	98
M. F.	113	F. N.	90
C. B.	109	N. H.	89
J. W.	109	V. S.	87
		M. B.	83
		M. S. J.	83

of the children in the A section was 11 to 12; in the B section 12 to 13.

Comment.—The three pupils in the B section with high intelligence quotients were placed there as a matter of policy, to avoid the appearance of a bright section and a dull section. It was, however, an injustice to them for their work was not as good as that of pupils in the A section with the same intelligence quotients, nor as good as their own work the previous year when the class was more mixed.

Comprehensive or Detailed Assignments

The assignment for the study of the geography of Norway and Sweden in both sections was: "Our history says the Northmen were brave and adventurous sailors and great wanderers. Can you find any geographical explanation of these qualities?" The A section gave very good reasons and were able to answer fact questions as a result of their study in solving the problem. The B section could do nothing at all with it. The assignment had to be changed and the questions at the end of the section in the geography textbook given. After they had been studied and recited, the children were able to solve the problem but even then they needed the teacher's help.

A history assignment was: "What did the Romans find in Britain?" When answering the question the A section mentioned physical features, customs, and religion as well as stories of the Britons. The B section told only stories until questioned by the teacher.

Both sections studied the Norman period in English history by means of such comprehensive questions as the above. In the test given at the end of the month, all of the A section made a grade of 75 percent or better, with a median of 83 percent; only five of the B section reached 75 percent and the median was 66 percent.

Comment and Conclusions.—It was difficult to teach the B section by comprehensive questions and problems because they noticed only stories and simple facts, and missed everything ab-

stract or not absolutely obvious. The A section was able to learn facts incidentally while solving a problem or finding the answer to a question, the B section was not able to learn in this way. The A section liked to study under the guidance of a problem or comprehensive question, the B section preferred detailed questions. It was advisable in the A section to assign a lesson in the textbook to be studied by means of a comprehensive question; to omit all explanation of the assignment unless demanded by the class; and to make the recitation a period of discussion of the assigned question, during which difficulties could be cleared up, new facts added, and the bearing of the question on other subjects discussed. In the B section, it was advisable to assign rather detailed questions with considerable explanation by the teacher, to ask these assigned questions in the recitation, and to use the comprehensive question at the end of the recitation or in a review lesson. It was advisable to omit drill on facts in the A section except at the end of each part of the subject while in the B section it was necessary to drill on facts during their study of the subject as well as at the end of each part, and to make the drill at the end intensive.

Use of Reference Books

Reference books, books of fiction, and magazines, were placed in the classroom and the children were allowed to use them in their free time. The B section used them sparingly, preferring to use free time for study of their assigned lessons. The A section used them very freely and often chose to take their lessons home so as to use their free time for history and biography, as well as stories.

In both sections a lesson on note-taking was given. An assignment was then made in Carpenter's "Geographical Readers," allotting a different part of the book to each pupil with instructions that she make a report the next day. The reports from A section were interesting and complete, their notes were organized in class and taken to the English teacher to be expanded into written paragraphs as part of their English work.

The B section enjoyed the assignment but their reports and notes were too fragmentary to be used for written work.

The teacher showed the A section a card catalogue and explained its use. She then told the class that each one would be expected to tell something about England the next day, and for material she referred them to the geographical readers, histories, and articles listed in the card catalogue. They prepared this assignment in school but were alone while doing so. All but one gave entirely satisfactory reports. Several who were using geographical magazines and found the articles long, decided only to show pictures. M. F. picked out the most interesting pictures, made notes about them, and gave her report well. M. L. showed pictures of the Shetland Islands which she prefaced by telling where the islands were; but she had made no choice among the pictures. The whole recitation took about fifty minutes, held the interest and attention of the children throughout the period, and was very successful. This was not tried in the B section.

Conclusions.—Collateral reading and reports were very valuable for the A section. If the references were short and definitely assigned they could occasionally be used in the B section for the sake of variety, their value being negligible; but it was hard to find time for them since the B section could no more than cover the minimum requirements.

Learning From the Outlines and Reports of Others

The geography assignment for the A section was: "What are the two chief industries of Great Britain? Why?" The instructions given were to read six pages quickly, neglecting details and keeping the question in mind as a guide. One section was read in class to illustrate the method of skimming because this was new work. The children did this reading in about fifteen minutes, were well prepared with arguments to support their choice, and could turn to the right place in the text to verify their statements. The B section covered the same ground by means of the more definite question, "Which is more important in Great

Britain, manufacturing or farming? Why?" and with the sections to be read definitely indicated by the teacher.

In the A section the teacher assigned a section in geography to be outlined, and the results of this effort were to be used as the basis of the recitation. The outlines were unsatisfactory for the children apparently attempted to make them without first rapidly reading the complete section. The teacher showed them that the skimming method was valuable as a preparation for an outline. Next, the A section was divided into groups of two or three, and each group was given a section in the geography textbook to outline and to recite upon. They were told that they must treat their subject so clearly and fully that the rest of the class could learn from them without studying the text for themselves. The outlines were fairly satisfactory but the other pupils could not learn in this way. The method was checked by having the whole class study the questions in the book covering the sections outlined and telling each one to mark the questions she had to look up. Practically every one marked every question except those on the section she had outlined. This was not tried with the B section.

Conclusion.—Outlining seemed to be a useful method with the A section, but it seemed necessary for each one to make every outline.

Gathering Material for Compositions

The teacher read an account of the Northmen while the A section took notes. They made their own choice as to what notes they should take and later expanded them into a composition. When the account was read to the B section the children asked what they should write as notes, interrupting the reading continually to ask if this or that should be noted. They wanted to take down the exact words of the book and two or three borrowed the book at study time with the result that their compositions were largely an assortment of quotations.

Conclusion.—This work was of little value to the B section though it seemed to do no harm.

Studying By Dramatizing

The whole class studied the Norman conquest by dramatizing it. The teacher assigned the text and told the children to pick out the scenes needed to tell the story. Both sections chose the same scenes but the A section was prepared and the B section had to do it as class work. The next day the teacher went over the conquest with the class and found the B section considerably confused as to nationality of persons and connection of events with persons. The A section were in good shape though they needed some help in seeing underlying causes. The class wrote the words for the scenes, the B section taking the simpler ones. The teacher was obliged to organize the written work and supply an outline. Then she read aloud a more complete account of each incident and the children took notes, following the outline. Afterward they wrote out the speeches. The teacher then combined the accounts, choosing the best from each paper and putting them together. The children cast the characters, choosing five of the seven principal characters from the A section and giving the other two to the two best in the B section. The scenes were given as a means of entertaining another class.

Comment.—Since so much direction and planning had to be done by the teacher, the project did not seem to be really the children's. Was it of as much value as a simpler one which could have been left to them? The children, however, thoroughly enjoyed it and had a decided sense of achievement when the scenes were written. They thought it was hard to do and attacked it with misgiving. Their sense of satisfaction was great when they found they could do it. In determining the value of this project, how much weight should be given to the self-confidence resulting from doing what seems a difficult thing?

A Class Party

The class party, a project unconnected with books, was the suggestion of the pupils. The teacher and the class president chose the chairmen of the committees, all from the A section. At a class meeting the chairmen were announced, the amount of

money to be spent was decided upon, the guests were chosen, and the date set. For a week the committees managed things themselves, the teacher meeting with them only when requested and giving advice only when asked. They consulted her frequently but usually to get her approval of a plan already formed, not to ask her to help make one. At the beginning of the second week the teacher went over all the plans carefully, volunteered advice and suggestions, and saw that the plans were sufficiently definite to ensure success. The teacher planned the work for the day of the party, deciding what committees should come in the morning and what ones in the afternoon.

Comment.—In carrying out this project the children fell into four classes. (1) Those who could manage and direct a group, plan a project as a whole and in detail, and see that it was carried out successfully. There were only two in this class, J. R. V. with an I. Q. of 113 and E. H. with an I. Q. of 116. (2) Those who could plan a small project, carry it through efficiently and direct one or at most two other people. In this were children with I. Q.'s ranging from 83 to 115. (3) Those who could think out and carry out a plan entrusted to them, but when that was finished came to ask what they should do next. In this class were three children with I. Q.'s over 120, two between 100 and 114, and one with an I. Q. of 90. (4) Those who needed constant direction, showed little sense of responsibility, and could not be depended upon. In this class were two children with I. Q.'s over 130 and four between 100 and 115. The five girls with I. Q.'s above 120 were in class 3 or 4, while those who were most capable had I. Q.'s ranging closely about 115. There was one marked exception to this in a girl with an I. Q. of only 83 who showed ability in getting people to work together harmoniously and to carry out her plans. She lacked decision where she had to depend on her own judgment but could choose between several plans or suggestions. She had immense enthusiasm and an excellent sense of responsibility.

Comment.—Should the responsible positions be given next time to those who made good or should some of the others be

given training? Why were the children with high intelligence quotients so lacking in ability and what should be done with them? The teacher was convinced that an occasional project unconnected with books is extremely valuable because of the encouragement it gives to the B section and the check it gives to the vanity of the A section. Such projects have an excellent unifying and equalizing effect.

Sand Table Project

The class had been studying the feudal system of land tenure and were to make an English manor on the sand table. The project was put in the hands of the four girls in each section with the highest intelligence quotients, each group of four to work separately. The teacher provided them with a book containing a plan of an English manor and a complete description and told them that they would be expected to plan and direct the work next day. The sand table had not been used by this class before and therefore they had nothing to guide them. The sand table had a top and was used as an ordinary table and at the time of the recitation the leaders of the A section failed to move the chairs out of the way. They put the top on the floor beside the sand table where it was very much in the way but apparently did not notice that or at least did not remedy it. Their plan was fairly well made but they had given no thought as to how it should be carried out and expended themselves in explanation instead of directing the actions of the rest of the class. The teacher said repeatedly, "What do you want us to do? Tell us how to make the manor." The children responded by saying, "We are going to put the mill here, this is to be the stream," etc., etc. They were ineffectual because they could not translate their ideas into action. Finally the two girls with I. Q.'s of 113 and 116 who had shown the greatest ability in organizing the class party, caught the idea and plan of the manor, took charge of the project, and directed it successfully. In the B section the plan was not so good but the practical details had been given more thought and the leaders were better able to give directions.

Comment.—The teacher was much impressed with the inefficiency of the children with I. Q.'s over 120 in organizing both the class party and the sand-table project. These girls are not the leaders of the class, they take only a minor part in class meetings and are not the ones who would mold public opinion or lead class activities. Upon investigation this was found to be true in other grades. There were exceptions, of course, but the rule held sufficiently true to be rather striking. Is this true in other groups of children and should it be so? Do the Binet tests discover a high order of intelligence only in connection with ideas and are children with that kind of intelligence really at a disadvantage in trying to carry out their ideas or is it merely lack of training? If the former, should they not receive intensive training in dealing with ideas with little insistence on translating them into action; if the latter, should they not be forced to organize and direct projects as well as plan them? In the first case they would be trained along the line of experts who furnish information and ideas, but their plans would be carried out by children with the somewhat lower intelligence quotients which apparently go with organizing and executive ability. Are these conclusions based on to few instances really to indicate anything or are they supported by the observations of others? The question seems important because if the very intelligent children can also be made effective they will be very powerful leaders.

A STUDY OF TEN GIFTED CHILDREN WHOSE SCHOOL PROGRESS WAS UNSATISFACTORY

DOROTHY VANALSTYNE
Teachers College, Columbia University

Ten children of superior mentality whose school marks were comparatively poor were studied at Public School 64, Manhattan, from October, 1921, to May, 1922. These children needed individual study for sociological as well as pedagogical reasons. Since the nation's leaders of the future will come from the gifted children of today, we cannot afford to lose any of them from the path of their fullest development and greatest usefulness. There are too few of them—only 2 percent of the entire population, Terman estimates—who have very superior mentality. Of this number, however, there must be throughout the country a great many who are not realizing their possibilities. When the problem is looked at in this light, a vast field of work is opened—a field in which this article is only an attempt at a method of attack.

The group which I studied were selected from the one hundred and twenty-five gifted children in the five "Terman classes" at Public School 64, on the following bases: (1) they had, of course, an I.Q. of 120 or more; (2) they had been reported by at least *two* teachers for their poor school work in comparison with their fellows; and (3) all physical causes for inferior work had supposedly been eliminated. When I started the study in October, 1921, there were only ten pupils at the school who came under all three of these classifications. The majority of the children were Russian Jews, although there was one Pole, one Rumanian, and one American Negro.

The fact that these children were in special Terman classes specializes the problem. In ordinary classes these children would simply be called average, or even stupid. Indeed, two of them were so called by their teachers before their intelligence quotients had been found and they had been put in the Terman Class.

The mental capacity of this group at Public School 64 was recognized. They had been placed with their fellows of approximately similar capacity, but they had not equalled them in their school work. What was the trouble? How could they be helped to gain their rightful place in their studies? This was the problem of my investigation.

A general outline was first made of the plan of attack on the problem. There were obviously two methods of obtaining evidence—objective and subjective. The objective evidence of the trouble was found by studying each pupil's perseverance at long tasks; his speed at finishing work; his accuracy of work; his attack on new problems; his learning curves on stated tasks; his scores on psychological tests, including memory tests; his success on subject-matter tests; and the results he obtained on psycho-physical tests, including tests of manual ability. The subjective evidence, ascertained by personal observation, consisted of: spirit of attack on work, conscious or unconscious resistance, emotional preoccupation, trouble due to indifference or over-anxiety, and previous bad habits of work.

This outline was then put into concrete terms with particular reference to sources of information. These sources of information were as follows:

I. Case history.
II. Teacher's report.
III. Teacher's marks.
IV. Pupil's permanent record card.
V. Visiting teacher's report.
VI. Stanford-Binet test.
VII. Pintner-Patterson performance tests.
VIII. Healy-Bronner learning tests A, B, C, D.
IX. Long period learning test.
X. Pintner non-language and educational tests.
XI. Woodworth-Mathews "Emotional Instability" test.

The case history consists of the child's history as a school problem. This was furnished for the most part by Miss Elizabeth Irwin, the school psychologist. The teacher's report is the general estimate of the pupil furnished at the time the study was first begun in October, 1921. The teacher's marks are the

marks on the report cards and, in some cases, those in the class books. The pupil's permanent record card is the record of the child in each grade from the time he entered school, whether Public School 64 or some other school. The visiting teacher's report is what its name implies.

The Stanford-Binet test is, of course, Terman's revision of the Binet-Simon test for general intelligence. The I.Q.'s resulting from these tests, together with the I.Q.'s obtained by the use of the same test two or three years before, are given in Table I.

TABLE I. INTELLIGENCE QUOTIENTS (BINET) OBTAINED BY RE-EXAMINING TEN CASES

Case	Former test (2 or 3 years ago)	October, '21
I	151	151
II	126	124
III	162	152
IV	138	117
V	121	118
VI	120	123
VII	125	124
VIII	129	134
IX	165	145
X	120	107

In two cases the result of the October testing exceeded the previous determination of the I.Q. The rises in these cases were 3 and 5 points, respectively. In one case the second result was exactly the same, and in three cases the I.Q. went down 1, 2, and 3 points. In four cases it fell anywhere from 10 to 21 points. Two of these cases (III and IX) can perhaps be explained by the fact that there were no more tests on the Terman blank for them to pass. This is especially true in respect to Case III.

The Pintner-Patterson performance tests were those of the short scale, comprising ten of the most indicative tests. These performance tests were used to supplement the Terman test and to afford a corrective, since a child with a superior language ability may be rated too high on the Terman test. Language ability is not always correlated with general intelligence. Since these children were of foreign extraction and since in some cases

English was not spoken in their homes, the performance tests would give them a better chance. Taking the results of these tests as a whole, it may be said they agree well with the Terman tests except in four cases—three of which are distinctly of the "verbalist" type and probably received too much credit for this on the Terman test. The fourth case is that of a little girl (Case V) who thought she was ill at the time of taking the test and did not seem to have the "push" to carry some of the performance tests through; she gave up too easily. Two of the tests she did not complete.

The Healy-Bronner tests are four learning tests A, B, C, and D. Only tentative norms have been established. These tests are designed to measure the learning capacity of individuals, learning being regarded as completed when the subject can repeat the material once without error. Test A involves visual learning for figures; test B, auditory learning for nonsense syllables; test C, auditory learning for figures; and test D, learning for sensible statements. Tests A, B, and C are tests of symbol learning, whereas test D is more concerned with concrete facts. These learning tests served as a partial analysis of each case, and were compared with the long period learning tests.

These long period learning tests (so-called for want of a better name) were devised to study the learning curve of the individuals over a period of three days in comparison with the average of their class. The material used was as much as possible like that which they would have in the classroom—first excluding all possibility that it was known to them. There were two of these tests, one biographical in material, and the other arithmetical. The biographical material corresponded to such subject matter as would have to be learned in history and geography. The arithmetical material showed learning ability in connection with numbers. The biographical test consisted of four short biographies of famous men which the subject studied for four minutes. A list of questions was then handed out, after a five minute interval, for the subject to fill in. He was likewise given four minutes for doing this. The arithmetical test consisted of

a list of sixteen multiplications of numbers between 11 and 19, with their answers. This was studied for four minutes and after the five minute interval the subject was presented with a list of these factors, arranged in a different order. He was to fill in the answers as he remembered them from the previous sheet. This procedure was repeated on the next day, and again on the third day.

These tests proved of value not only in analyzing the way in which the individual mind learned new material and which kind of material he was more capable of learning, but also in comparing each individual with the class as a whole. If the reason for the child's not getting on as fast as his fellows lay here it could easily be found. Only two pupils out of the seven to whom these tests could be given rose above the average of the class. Case I and Case IV surpassed the class average in the arithmetic test.

The Pintner non-language mental and educational tests were next given to the children. These were valuable for a number of reasons. They give the individual's educational standing in the same terms as his mental standing; they record the difference between these; and they indicated in this instance what sort of work each pupil was doing in each subject in comparison with grade norms. The subjects which were measured were arithmetic, reading, grammar, geography, and history. The results were in general that the educational index for the child's age was "very good" in two cases, "good" in six, and "average" in the other two, while the mental indices were in three cases "bright," in three cases "high normal," and in four cases "normal." One of these last cases was found by the second Terman test to be normal in intelligence and another, an older boy, did not take his test seriously enough and consequently did poorly in it. As for the differences between the educational and mental indices, there was only one below –9 (called by Pintner a serious difference) and this was –12 (Case III). In all but two instances the grade educational index came out as "good grade work." Of course, this was for the average class, and meant little in these cases. All Terman class children should probably

have a "very good" grade index. One boy had such an index but it was discovered that two of the subjects in which he was failing—spelling and writing—were not measured by these Pintner tests. The other case was one of "average" grade work and was made by the boy who was rated normal on the second Terman test.

The foregoing tests gave a fairly clear analysis of the various mental traits of these individuals. I then wished to discover whether or not there were emotional hindrances to the work of these children. I could get an idea objectively of what these might be from the emotional instability test compiled by Miss Ellen Mathews and Miss Elizabeth Irwin, on the basis of that made by Woodworth for the soldiers during the war. These tests are called tests for emotional instability for want of a better name. Perhaps a more exact term would be tests of emotional mal-adjustment. The main cause of this seemed to have to do with fear or with an "inferiority complex." Not only did this test serve in analyzing the individual cases, but it also gave results which might be said to be indicative of the group as well. The questions which were answered unfavorably by more than half of these children are as follows: Have you ever been homesick? Is there any food that disgusts you so that you cannot eat it? Do you sometimes feel very happy and then suddenly very sad? Are you afraid of noises in the night? Do you dream of robbers? Are you over-particular about your food? Do you sometimes feel that nobody quite understands you? Do you ever think stories to yourself so that you forget where you are?

The analytical study, as outlined above, was made during the first term of the school year. It was evident from the results of this that some sort of reconstructive work should be attempted. Besides the follow-up work with individual pupils, a plan for the group was also made. Since the chief trouble with these children was lack of effort, a special stimulation in this direction was necessary. The plan was as follows:

Competition under stimulating conditions was made the basis of the work. The children were divided into two groups which were then formed into clubs. This division was made so that the two clubs would be equal (as far as possible) in their I.Q. distribution. The true reason for forming the clubs was explained to the children who were very much interested. They were allowed to take the matter entirely into their own hands and to elect their own president and secretary. Each club also chose a name and the two clubs jointly selected the reward which was to come to the one winning at the end of the term. The winning club was to be the one which made the most progress from that point to the end of the term.

This progress was to be determined, in the first place, by the use of standardized educational tests, given in equivalent forms at the beginning and end of the term. These tests also enabled us to diagnose the particular difficulty of each child rather minutely. Since it was not known how much progress a child of a certain intelligence quotient should make on a given test a "control" was selected to take the same tests. These controls were chosen on the basis of similar intelligence quotients, ages, and grades, the only point of difference being the fact that these children were making satisfactory school progress according to their intelligence quotients. The controls also aroused the element of competition in a human, tangible form. The children were made to see that their individual controls were like them in every way and that there was no reason whatever why they should not do as good work. This tangible rivalry was further increased by charting in understandable form (as steps on ladders) the results of the first group of educational tests. Each child could see where he stood in each subject in relation both to his control and to his grade norm. This furnished an objective for him to work toward in preparation for the next tests.

In the second place, progress during the term was measured by means of the teacher's report marks (especially the rating as to *effort*) in relation to the control pupil's report and, in the third place, by the teacher's word that the child was improving. A

scale of credits was constructed whereby each child would gain a certain number according to the progress made in each of the above points. Credits on the last two points were totaled every month and a graph of progress was made out by each child as well as a composite graph for each club.

When the clubs were first formed it was explained that help would be given them in the subjects which were hardest for them, if they so desired, but that no help would be given their controls. Needless to say, each child took advantage of this, with the result that a series of individual tutoring lessons were given each week. In these the special difficulties of each child were analyzed more carefully, and as far as possible the proper remedies were applied. Club meetings were held every two weeks. Special educational practice tests were given at this time, such as the Courtis Arithmetic Practice Tests, Courtis Handwriting Tests, and informal true-false tests based on the special subject matter which they had covered in class during the previous two weeks. The clubs met separately after the first meeting, so that more individual attention could be given each member. This also stimulated a feeling of unity on each side. Finally at the end of the term equivalent forms of the standardized tests were given.

The results of this reconstructive work as a whole will be indicated later. Meanwhile a detailed report concerning two typical cases will serve to place before the reader the concrete working of the plan.

Case I

Harold S., eleven years old, is considered by the psychologist, Miss Irwin, to be a typical case of this group. He is a small, dark little fellow with brown eyes, which have a trick of glancing off to the side in an odd way when he is in conversation—which is always a one-sided conversation. He is the youngest of a family of much older brothers and sisters, all of whom are bright and successful. Much has been expected of him. His I.Q. is 151—one of the highest in the school. The members of his family have constantly looked for him to "come across," as it were. It is disappointing to them, therefore, when he shows signs of dreamy inactivity and indifference to lessons and even to reading. He does not easily express himself in words. His only show of interest at the time the visiting teacher knew him was in the boy-toy "erector" with which he never tired of building and inventing.

Harold is in the VI-B Terman class. His teacher reports that he is lazy, that he does work in spurts, but that he can do it if he tries. There is a spark of originality in his compositions. His card record shows that he had received "A" in the regular classes, but that when he was transferred to the Terman class in November, 1919, he received "B+." By June, 1920, his rating had fallen to "B" where it has remained ever since. Theoretically, children in Terman classes should have "A." His latest report card shows that he has "B" in general effort and "B" in proficiency, and that his weakness is his lack of ambition in school work, especially in history and geography.

His Binet tests were most consistent. The three given him resulted in I.Q.'s of 151, 150, and 151. He made especially good responses in all the tests dealing with numbers, passing successfully the "8 digits forward" and the "7 digits backward" in the superior adult group, and the "6 digits forward" and the problem of the enclosed boxes under the average adult heading. He had no poor responses. The median mental age of this performance test (Pintner-Patterson) was 14, correlating well, therefore, with the Binet test.

The results of his Healy-Bronner learning tests showed that he was decidedly below the average in tests A, B and C, but above it in test D. This is evidence that his learning capacity for symbols is very poor, but that for concrete facts involved in sensible statements it is good.

The long period learning test showed that he is above the average of his class in his ability to learn numbers (also proven on the Binet test), but that he is far below it in less concrete things, such as the biography offers. It showed also that in the second learning he did not learn very much more than in the first. This agrees with two of the Healy-Bronner tests (B and C), which sank to an even lower level on the second trial. It was likewise noted on the long period learning test that an unusual number of answers were guessed at—that is, they were the right answers for some of the questions but placed after the wrong ones. On the whole, this would seem to indicate that Harold's learning ability is normal in concrete things but very slow in abstract ones, and that to cover his defect he has a habit of guessing at answers when in competition with his classmates.

His Pintner mental tests unaccountably gave him a comparatively low rating—that of a low normal child. His educational index showed that he was doing good work for his age and good work for the average sixth-grade age. His difference was +27—meaning that his educational work was that much ahead of this mentality—on the basis of this test. Strangely enough, his reading, grammar, and arithmetic were nearer to the average for the grade than his geography and history, whereas his teacher had reported him weak in these last two. Perhaps this showed that the criterion by which the teacher judged him was not fair.

The test for emotional instability did not show him to be neurotic at all, as his number of unfavorable answers was 24, while the median

for his age is 25. This test also showed that he was a rather sensitive child, and perhaps subject to moods.

From the analysis, my suggestions for Harold were that, since he was not able to vitalize symbols, he needed motivated teaching such as Dewey advocates. He needed a period of intimate supervision to train his habits of attention, but must not be prodded into learning—he seemed to have already had too much of this. I also suggested that he should be allowed to take his own steps in advance, believing, as I did, that when he once saw that he could learn he would have more confidence in himself. Better *rapport* needed to be established between his teacher and himself, because of his rather sensitive nature and his distrust in his own abilities. On the whole, his need was for concrete problems for his work.

From the start of the club Harold was one of its most interested members. His reaction toward work seemed to change, for instead of the boy who shook his head and did not talk much and "didn't want any help anyway" he became a most enthusiastic advocate of the private tutoring lessons, and really seemed to want to have his difficulties cleared up. This was especially noticeable in the case of the arithmetic practice tests. He immediately became fascinated with them—a concrete object—and always wished to keep on with them longer than the other children. In the tutoring lessons some of his geography difficulties were analyzed more minutely and practice was given him in spelling. He seemed to have more confidence in himself.

His report marks for April were: Effort, B+; Proficiency, B+; and Conduct, A. These may be compared with the marks of B, B, B, in February. In the survey which Dr. McCall made at P. S. 64 about the time of our second testing and which was based on reading, arithmetic, and spelling, Harold S. was found to be doing work equal to the 8.6 grade.

Although no prediction for the future can be offered, it is evident that a start in the right direction has been made—particularly in the matter of attitude.

Case III

Charles J. is considered one of the most problematical cases in the school. He has one of the highest I.Q.'s there—152, probably 162. He is a handsome colored boy of twelve years, with curly black hair and a smooth light brown skin. His dark eyes have a mischievous twinkle in them and light up in a fascinating way when there is the slightest bit of humor in the situation. The family background is excellent. His family are people of education and refinement. The father has held a government position on Ellis Island for a number of years. Charles is a leader in his neighborhood of a gang of boys which his mother characterizes as rather wild.

Charles came from the Ethical Culture School where he was also a problem case. He is in the VI-B class at P. S. 64. The teacher reported

that he was lazy, but that he had a mature mind; that he had a capacity for doing a lot of work when he wanted to; that what he did was done well; and that he was deeply interested in whatever was done in the classroom, particularly when done by someone else. He is also reported as self-reliant and self-willed. Charles' case is complicated by his awkward manner of handwriting. He not only writes with his left hand, but holds his pen as if he were writing backward. This makes his writing very slow indeed.

His card record shows that he was left back when in grade v at the Ethical Culture School. His work has never been "A" and he has been reported not proficient in arithmetic and English. In the spring term of 1921 he received "C" in proficiency of work. His report card for the year gave him "B" in proficiency, but "C" in effort for two months. He has been reported deficient in homework, conduct, and effort.

The Binet test gave him an I.Q. of 152, but this is probably lower than he should have, since there were no more tests in the booklet to pass, except the two highest in vocabulary. His I.Q. when he was in the fifth grade at the Ethical Culture School was 162—probably more nearly his true rating. The results of the performance test correlated well with the Binet test, since he received a median mental age score of 16 or adult (Pintner says they are synonymous in this scale). It may be said here that some psycho-physical tests were also given Charles because of his handwriting disability, such as the tapping and steadiness tests. In the tapping tests he showed a high degree of muscular control, but he did poorly in the steadiness test.

The Healy-Bronner learning tests indicated that he is far above the average in learning capacity, except in the auditory learning of nonsense syllables. The good results, however, of this test do not correspond with those of the long period learning test. On both the biographical and arithmetical materials he was below the average of the Terman class in which he was enrolled. I would explain this discrepancy, first, by the fact that the latter tests were written and his writing was much slower than that of the class, and, second, by the fact that in the former test I was "standing over him," as it were, and he had to make the effort, whereas in the long period learning test he did not exert himself.

The difference between the Pintner mental and educational tests was the greatest one of all the cases, namely—12. In other words, his educational work as rated on the scales was that much below his mental level. Nevertheless, for his age his mental rating was "bright" and his educational rating, "good." His grade index for the average sixth grade was "good."

Charles was inclined to be emotionally unstable. His score on the Woodworth-Mathews test was 32 unfavorable answers, while the median for his age was 20.

Because of his emotionally unstable condition, I suggested that Charles' play, food, and sleep be more closely supervised. I also sug-

gested that he be taught by means of concrete facts, rather than abstractions. He needed training along motor lines to help him gain proper control of his handwriting. Charles especially needed individual coaching to learn proper habits of study.

Recently the teacher reports a marked change in Charles. He takes a great deal more interest in his work and puts more effort into it. Credit for this is due in part to the fact that the principal of the school had him bring a report to him every week. His latest report marks give him "A" in effort, "B+" in proficiency and "B+" in conduct—a distinct improvement over the previous year.

Charles was given some lessons with the Courtis handwriting practice tests, but the period was so short that little actual results could be seen. He has improved throughout the whole year, however, since he is now able to do all of his homework in long hand.

He was coached in proper habits of study, and he followed with interest the various points outlined in Achilles' "How to Study." His special difficulties were diagnosed more minutely—e. g., methods of remembering subject matter read, and adding up a column of figures—and the proper remedies were applied.

In May it was planned that Charles, since he had improved so much in effort and interest, should be sent to the High School the following fall. It was thought that he would be perfectly capable of handling the work there and that he would thus be stimulated to keep up with his associates.

Conclusion

In summing up the analytic study of these cases, the main symptoms seem to be: laziness, shyness, day-dreaming, indifference, sensitiveness to criticism, and hypochondriac fears resulting in irregular attendance. These results agree in a remarkable way with those obtained by Miss Richards[1] in a study of borderline cases which did not "live up" to their intelligence quotients.

A rough classification of the causes of their problems is:

1. Neuropathic tendencies.
2. Innate character difficulties.
3. Home environment not normal.
   a. Too gloomy.
   b. Emotional disturbances.
   c. Family prejudices.
   d. Too much responsibility on the child.
   e. Too little responsibility on the child.

[1] Richards, Esther Loring. "The elementary school and the individual child." *Mental Hygiene*, 5:707-723, October, 1921.

f. Attitude of over-protection on part of parents.
g. Influence of older children.
h. Spoiling of the child.
i. Pressure on the child too great.

4. Trouble in the school.
   a. Prejudice against the teacher.
   b. Fear of the teacher.
   c. Not enough individual attention, especially in the matter of teaching the child how to study.

It was found that out of the nine true cases, six of the children had a tendency toward emotional instability. All of these which could be measured by Miss Mathews' norms were 25 percent beyond the median—that is, they had more unfavorable answers than 75 percent of the children she tested. This seems to me to be largely indicative of the trouble. This statement, however, must not be taken to mean that superior children as a class are emotionally unstable. According to Pintner's findings there is probably the same percent of emotionally unstable persons in this group as in the general population. The results in these cases simply constitute one of the chief reasons why these children did not measure up to the expectations created by their intelligence quotients.

This leads to the more far-reaching suggestion, namely, that we need in our schools classes similar to the neurotic class at P. S. 64 in the earlier grades. In this class there is a special program suited to individual needs, and there is a teacher whose attitude to the class, while full of sympathy and gentleness, has that quality of wholesome vigor which inspires effort in response. Such a class provides the means of "setting up" the personality of the individual child. It affords a chance for a closer observation and study of his needs than is possible in a regular classroom. Wonderful results have already been obtained with a number of the children. If we could have, therefore, more such classes in the lower grades and so get the problems "while young," the schools might be fairly free from them in the upper grades.

The value of such a study as this lies, I think, in the opportunities for analysis beyond the teacher's marks and judgment,

the elimination of possible adverse factors, and the aid which the results give in applying remedial measures. All schools probably have cases such as those described, but they are not generally recognized. The children, although in reality unusually capable, are merely thought of as "average," and the matter is let go at that.

The reconstructive work of the clubs was chiefly valuable in indicating a method of procedure. The actual time during which this work was in progress—a little over two months—was so short that much in the way of results could not be expected. It was found, however, that most of the cases made greater progress or the same progress on the average (according to the educational tests) as their controls in the same amount of time. It may be concluded that if a child of very superior mentality is placed in a concrete social situation such as competition affords and given a concrete analysis of his difficulties, he will, if all other conditions are equal, overcome obstacles and previous bad habits of work and strive to take his rightful place with his fellows.

The credit for these results, however, cannot be entirely claimed by this reconstructive work. To the teachers is due a large share. But the very fact that these cases were being studied and experimented with gave to the teachers, I believe, an experimental attitude, and centered their attention on the particular difficulties of each child.

THE USE OF AMERICAN TESTS TO MEASURE ENGLISH TEACHING IN CHINA

STERLING G. BRINKLEY
Soochow University, Soochow, China

Where English is taught as a foreign language there is at hand a wealth of test material which is lacking for the modern language teacher in American schools. It is true that the tests were devised for those to whom English is a native language and no doubt they need adaptation when used to measure the English ability of foreigners. They have value, however, in their original form. There is, moreover, an advantage in using the tests just as they are, in that this makes possible a rough comparison with American norms.

English forms a very important part of the curriculum of schools established by American missionaries in China. It is, indeed, one of the strongest attractions of such schools. English in boys' schools in East China is in general begun three years below the middle school[1]. It is taught from five to ten hours a week throughout the middle-school course. In the upper years of the middle-school course, classes in science, Western history, and Bible are frequently taught in English. In missionary colleges English is the medium of instruction except in the teaching of Chinese literature and allied subjects. Since the colleges offer courses closely paralleling those in American colleges, the effectiveness of the English teaching in the middle school is a matter of prime concern, at least in so far as students preparing for college are concerned.

Such questions as these arise: How does the middle-school graduate in China compare in ability to read, write, and understand English with the graduate from the American high school? He is supposed to make the same use of English in his college work that the American student makes. Do middle-school pupils taking English as a foreign language advance as rapidly as the

[1]The Middle School corresponds to the American high school.

American child in the grades? They are much more mature, yet the language is a foreign language for them. The facts reported here have a bearing on these questions. They have come to light incidentally in the attempt to use certain standard English tests to measure the results of English teaching in Soochow University Middle School No. 1 during the year 1921-1922.

This school enrolls about 350 boys ranging in age from 14 to 30. It is probably fairly typical of the college preparatory middle school of East China. The following tests were given during the year 1921-1922:

In Sept. 1921—Thorndike-McCall Reading Scale, Forms 1 and 2. (Form 2 to the second year; Form 1 to all others.)
Trabue Language Scale Beta, to all classes.

In Jan. 1922—Haggerty Reading Examination Sigma 1, to two classes.
Spelling test taken from Ayres' Spelling Scale, to all classes.

In Feb. 1922—Thorndike-McCall Reading Scale, Form 1.

In June 1922—Trabue Language Scale Beta.
Thorndike-McCall Reading Scale, Forms 2 and 3.
Spelling test as above.

Besides these, other tests devised specifically for Chinese students were given. These latter, however, offer no possibility of comparison with American norms.

The results for the Thorndike-McCall Reading Scale are shown in Table I. The scores in September, February, and June are in T-scores. The next column gives the grade equivalent according to American norms. Thus 3.9 means "Nine-tenths of the work of the third grade;" 5.0 means "beginning of the fifth grade or end of the fourth grade."

By comparing each class with the American grade norms it is seen that the first two classes have the same ability as American children who have studied an equal length of time. The

TABLE I. THORNDIKE-MCCALL READING SCALE, SOOCHOW UNIVERSITY MIDDLE SCHOOL NO. 1

	Sept. 1921	Feb. 1922	June 1922	Grade equivalent reached in June	Years of English study
Preparatory Class			36.7	3.9	3
Middle School, 1st year	31.3	36.5	41.7	5.0	4
2d year	40.0	40.2	45.9	5.6	5
3d year	41.4	46.4	48.7	6.1	6
4th year	48.2	52.8	53.2	6.9	7
Junior College, 1st year		50.6	52.0	6.7	8
2d year		54.3			9

second-year class is 0.4 of a year behind, the third-year 0.9 of a year, and the fourth-year 1.1 years. It would seem that in the earlier years of language study Chinese boys in this school make equal progress with American grade children in reading ability, while in the later years they fall behind. However, in Table I we are comparing different groups of pupils. Table II shows the actual progress made by each class during the school year.

TABLE II. IMPROVEMENT IN READING ABILITY—COMPREHENSION THORNDIKE-MCCALL READING SCALE

(Figures indicate grade norms—United States—attained at stated times.)

	Sept.	Feb.	June	Improvement Grade Years
Preparatory Class			3.9	
Middle School, 1st Year	3.2	3.9	5.0	1.8
2nd Year	4.6	4.6	5.6	1.0
3rd Year	4.9	5.6	6.1	1.2
4th Year	6.0	6.8	6.9	0.9
Average				1.2
Junior College, 1st Year		6.5	6.7	0.2*
2nd Year		7.1		

*In half a year.

Here it is seen that only one class in the middle school made less than one grade of progress, while the average of the four middle-school classes was 1.2 times the American standard. Attention might be called to the fact that this progress was made by a very highly selected group of boys of high-school age. The selection is probably narrower than one in 100 boys of their age.

How this highly selected group would compare in intelligence with the average American grade child we have no way of determining at present.

The apparent discrepancy between Tables I and II may be due to any one of several factors. (1) The test may have measured a certain amount of "practice effect," in which case the figures representing improvement for each class are too large. However, it may be open to question whether there would be more "practice effect" for foreigners than for American grade children. (2) The new pupils entering the different classes from year to year might lower the average of the class. Of the pupils of the first year 52 percent did not come from the preparatory class; 39 percent of the second-year pupils were new; 25 percent of the third-year, and 20 percent of the fourth-year were new. A study of each of the four classes, however, shows that during the past year the new pupils did not lower the class average by more than a fraction of a point in the T-score. It is probably safe to assume that this has been the case in the past. (3) If instruction has been improved or standards in English have been raised at the Middle School during the past few years, the crowding together of classes as seen in Table I would be the natural result. Undoubtedly better results are now being secured than in the past. More and more importance has been attached to beginning English and better trained teachers have been obtained. Since the use of standard tests in this school does not extend back of the year 1921-1922 there is at hand, however, no objective evidence that this is the case. This third explanation is accepted as being probably the largest factor in producing the discrepancy noted between Tables I and II, as to improvement.

The most interesting fact brought to light by the reading test is that Chinese boys enter college where their work must be done in English with the reading ability of American children who are beginning the seventh grade. That they do satisfactory work in spite of this handicap is remarkable. For the colleges to continue to base their work on English text books after the necessity for this shall have passed would be unjustifiable. One

of the most urgent tasks for Chinese scholars today is to prepare college text books in the Chinese language.

A third fact suggested by the reading test is that the rate of improvement decreases in the higher years of language study and practically ceases after the middle school (Table II). The improvement decreases from 1.8 units in the first year to 0.9 units in the fourth year and 0.4 units in the first year of college. Moreover, the old students in junior college first year, who were 50 percent of the total, made no gain during the second semester. In other words, all the gain was made by the new students. Four college seniors who were tested during the fall semester made an average score of 54, only two points higher than the junior college first-year average.

The results in spelling are in some ways the reverse of those in reading. The average gain is only 60 percent of the American standards, while the classes show an average of a full American grade between them (Table III). The words that made up the test were selected from the Ayres list on the basis of their

TABLE III. IMPROVEMENT IN SPELLING ABILITY: ONE SEMESTER AYRES SPELLING SCALE

(Figures indicate grade norms—United States—attained at stated times.)

	Jan.	June	Improvement
Preparatory Class	2.8	3.3	0.5
Middle School, 1st Year	3.9	4.0	0.1
2nd Year	5.3	5.5	0.2
3rd Year	6.4	7.0	0.6
4th Year	7.2	7.2	0.0
Average			0.3

occurrence also in Thorndike's first 1000. Since the Chinese boys' acquaintance with words is almost entirely through what he reads, it was felt that this selection would increase rather than decrease the reliability of the comparison.

No very great value is attached to the spelling test scores since the difficulty value of words for foreign students may be quite different from that for natives. Spelling is taught only inci-

dentally in connection with reading and composition. It is seen from Table III that it is the failure of three classes to make any appreciable gain that makes the average gain so small. The failure in the case of these classes can be largely accounted for on the basis of known conditions lately prevailing in these classes.

When the scores on all the tests given are turned into American grade standards for purposes of comparison (Table IV), it is seen that the results as shown by the different tests correspond only roughly. This, however, is not surprising. Reading, spelling, and the ability to handle the language which the completion test measures are different functions, and the rate of improvement in each might well be different. The notable fact is that the correspondence is as close as it is.

There is a real discrepancy between the results of the two reading tests, which might be explained by the fact that the Haggerty test involves "following directions" which is certainly a function different from reading and which may be more difficult in a foreign language than in one's own. Moreover, this type of test was entirely new to the pupils taking it.

A few statements in explanation of Table IV should be given. (1) Test norms as reported by Haggerty and Trabue for the reading and completion tests were considered to be for the middle of the year (January). The authors do not seem to have

TABLE IV. ENGLISH ABILITY OF CHINESE MIDDLE SCHOOL PUPILS COMPARED WITH THAT OF AMERICAN ELEMENTARY SCHOOL PUPILS

	Age	Years of English Study	U. S. Grade Norm Reached June, 1922				
			Thorndike-McCall Reading Forms 2 & 3	Haggerty Reading Average of Tests 1 & 2	Trabue completion, Beta	Spelling Ayres	Rate of Reading, Starch
Preparatory Class	14.3	3	3.9		3.6	3.3	2.5
Middle School, 1st Year	16.0	4	5.0	4.0	(4.0)	4.0	3.2
2nd Year	17.2	5	5.6		(4.3)	5.5	3.4
3rd Year	17.9	6	6.1		4.6	7.0	
4th Year	19.1	7	6.9		5.1	7.2	

given a date. June norms were calculated from these. (2) The results, in the Haggerty test, of Test 1 and Test 2 were averaged to get a single figure, though Haggerty does not suggest this procedure. (3) The norms used for the completion test are the "tentative norms" proposed by Kelley. No other norms were available. A more simple method of scoring than that proposed by Kelley is customarily used with this test in China. It was thought sufficient for this study to compute the difficulty scores for three classes only. The first and second year classes were interpolated. (4) The rate of reading was obtained in connection with informal reading tests based on the regular reading text for the class. These rates were compared with the norms given by Starch. It is recognized that, since the Starch tests were not given, the results are only very rough approximations. (5) From the median age, as reported by the pupils, 1.5 years were subtracted in order to approximate the actual age. (The Chinese method of counting age is quite different from the American and results in representing the child to be older than he really is.)

A comparison of the standing of the classes on the reading (Thorndike-McCall) and on the completion tests shows about what would be expected. It is well recognized that to read and understand a foreign language is easier than to handle the language in the construction of grammatically correct sentences. The progress in the middle school seems to be about twice as rapid in the comprehension of reading material.

The rate of reading is notably lower than the American standards, and very little improvement seems to be made from year to year. That this has been due to failure to emphasize speed in reading rather than to the fact that there is any inherent difficulty in reading a foreign language rapidly is shown by the results of special work in the first year near the close of the spring semester where the class advanced within a period of five weeks from a rate of 111 words a minute to a rate of 141. This is a gain from a grade equivalent of 3.2 to one of 5.0 (Starch).

As a check on the validity of the tests, the correlations with the teachers' marks in English were calculated. The teachers'

marks include other features than those measured by the tests, notably ability in oral reading and the ability to understand and speak English. Moreover, teachers' marks at best are known to be uncertain measures of real ability. But the correlations are, on the whole, rather high. The correlations for a test made up of 55 opposites, devised for the specific purpose of measuring the English ability of Chinese students, are included for comparison, and also correlations where tests are combined (Table V). The average correlation with teachers' marks is .60 for the Thorndike-McCall test, .56 for the completion test, and .62 for the opposites test, while the composite of the three tests gives a correlation of .72. Moreover, the correlations are higher in the case of the more experienced teachers, i.e., those in the two lowest classes. The rank-order method of computing the coefficient of correlation was used.

TABLE V. CORRESPONDENCE BETWEEN TEACHERS' MARKS IN ENGLISH AND THE RESULTS OF ENGLISH TESTS

Teachers Marks with	Preparatory Class	First Year	2nd Year		3rd Year		Fourth Year	Average
			Section One	Section Two	Section One	Section Two		
Thorndike-McCall Reading Scale	.79	.67	...	.54	.73	.43	.46	.60
Trabue Completion Scale	.76	.67	.64	.59	.53	.30	.40	.56
Key, Opposites, A	.80	.70	.50	.69	.71	.48	.48	.62
Average of Thorndike-McCall and Trabue Scales	.81	.76	...	...	.68	.48	...	...
Composite of the three Tests	.89	.76	.70	.73	.88	.55	.51	.72
Number of Pupils	35	90	33	31	27	30	52	...

Summary

(1) Chinese boys from this school enter college, where their work must be done in English, with the ability in comprehending reading matter of the American child who enters the seventh grade. The rate of reading of this group is very slow, probably

not equal to that of the American fourth grade.[2] The general ability to use the language, as measured by the Trabue completion test, is two years behind the ability to comprehend reading or about equal to that of the American fifth grade.

(2) From the fourth to the seventh year inclusive of language study there is an average gain per year in reading ability of 1.2 times the American standard. The rate of gain becomes less in the higher years of the middle-school course and practically ceases in the college.

(3) Although spelling is not taught as a separate subject, spelling ability corresponds rather closely with reading ability.

(4) More rapid progress is made in ability to understand reading material than in ability to use the language independently.

(5) Some English language and reading tests prepared for American children have a decided value as measures of certain phases of English teaching in a foreign country.

Questions for Consideration

1. Would it be possible for the modern language teacher in America to use, as a measure of the success of his teaching, language and reading tests now in use in the country where the language is native?

2. Would modern language tests that contained more reading and less of vocabulary and translation—an expansion and development of the Handschin Tests along the lines of the Thorndike-McCall Reading Scale—have an advantage from the point of view of teaching in that they would tend to cause the modern language teacher to emphasize reading rather than translation?

3. How does the progress made by students of modern languages in American high schools compare with that made by elementary school children where the language is native?

4. How does the progress made in English by German or French students compare with that made by Chinese students?

[2]This is inferred only. The pupils of the fourth year were tested in rate of reading with material in one of their text books, "Howe's European History." The rate was 79 words per minute.

YEARS IN SCHOOL AND ACHIEVEMENTS IN READING AND ARITHMETIC

CHAS. L. HARLAN
State Normal School, Lewiston, Idaho

All studies of individual differences among pupils indicate that the amount of time spent in accomplishing a given task, no matter how simple, varies greatly. Some pupils read twelve times as rapidly and comprehend ten times as much as others of the same class. Yet they have all spent the same amount of time in school under the same instruction. This situation indicates that equal amounts of time spent on the same school task does not guarantee equivalent school attainments.

The prevailing standard of promotion from grade to grade is a year's time spent in a given grade rather than the quality of work done or the standard of achievement reached. In case a pupil is not promoted, he is retained in the same grade on the assumption that spending another year or half-year in doing the same tasks at which he has previously failed will assure his success in those tasks. If a superintendent wishes to secure better results in a given subject in his schools the first remedy usually offered is "spending more time on that subject."

The data submitted herewith bear on the question of the relation between time spent in school and achievement in reading and arithmetic. The Monroe Silent Reading Tests Form I and the Monroe Reasoning Tests in Arithmetic Form 1 were given to nearly nine hundred pupils in grades four to eight whose records of school attendance were complete.

The scores in silent-reading rate and comprehension were grouped according to the number of years pupils had spent in school. If a pupil in the fifth grade, for example, had spent only three or four school years in reaching that grade he was counted in the less-than-normal time group. If he were in the fifth grade and had spent five years in reaching that grade he was counted in the normal time group. If he had spent six or more years in

school and was only in the fifth grade he was counted in the more-than-normal time group. In a similar way pupils from the fourth to eighth grade were grouped in normal, less-than-normal, and more-than-normal time groups. In the tables which follow, the columns headed "1" are for the less-than-normal time groups, those headed "2" are for normal time groups, and those headed "3" are for more-than-normal time groups.

Table I shows the median rate and comprehension scores in reading for each of these groups by grades. If the amount of time spent were an important factor in determining how well pupils learn to read, one would expect those pupils who had been in school longer than the normal amount of time to show the highest degree of reading achievement and those who had been in school less than the normal amount of time to show the lowest degree of achievement. The figures of Table I show just the reverse of this to be true. The medians in both rate and comprehension for the less-than-normal time group are in every case distinctly higher than those for the more-than-normal time group. These differences in the medians are presented graphically in Figures 1 and 2. The more-than-normal time group have presumably had from two to six years more of instruction and practice in reading than the less-than-normal time group, yet they have not learned to read as well. Table I suggests that it is not the *amount* of time spent that counts toward achievement but *how* and *by whom* the time is spent. From data[1] on these same pupils, not presented herewith, the more-than-normal time group are found to be the over-age pupils and the less-than-

TABLE I. GROUP SCORES IN RATE AND COMPREHENSION OF READING

	Grade IV			Grade V			Grade VI			Grade VII			Grade VIII		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Number of pupils	15	95	24	32	129	34	28	118	38	52	125	23	57	103	9
Median rate	80	67	44	98	77	82	93	93	85	102	99	86	131	107	90
Median comprehension	15.0	12.3	7.0	19.4	15.0	14.5	21.0	20.6	16.8	27.0	21.0	18.6	31.0	24.3	24.0

[1]Harlan, C. L. "The age-grade status as an index of school achievement," *Educational Administration and Supervision*, 8: 413-23, May, 1922.

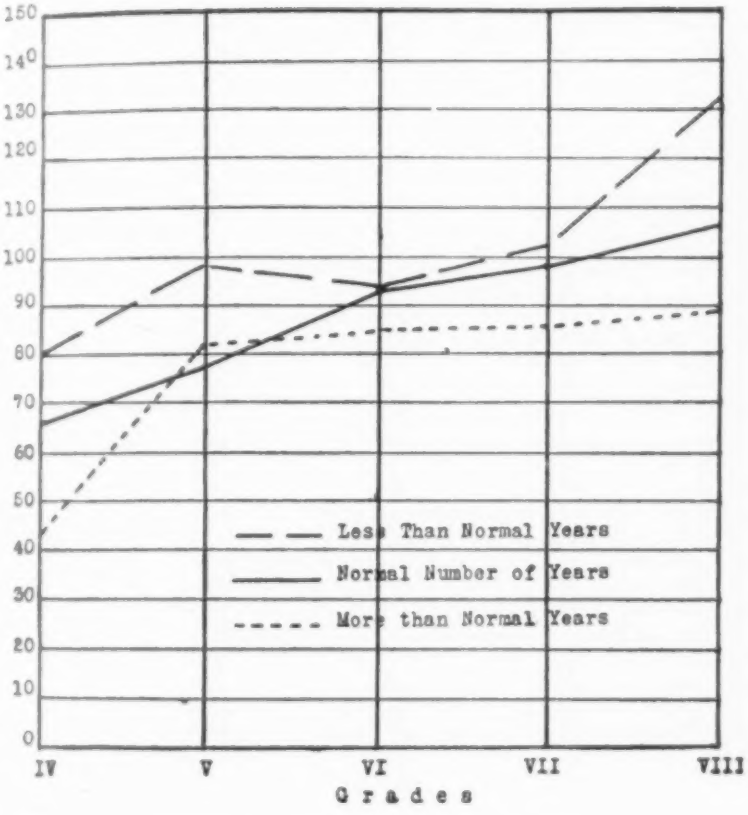

FIGURE 1. RATE IN SILENT READING

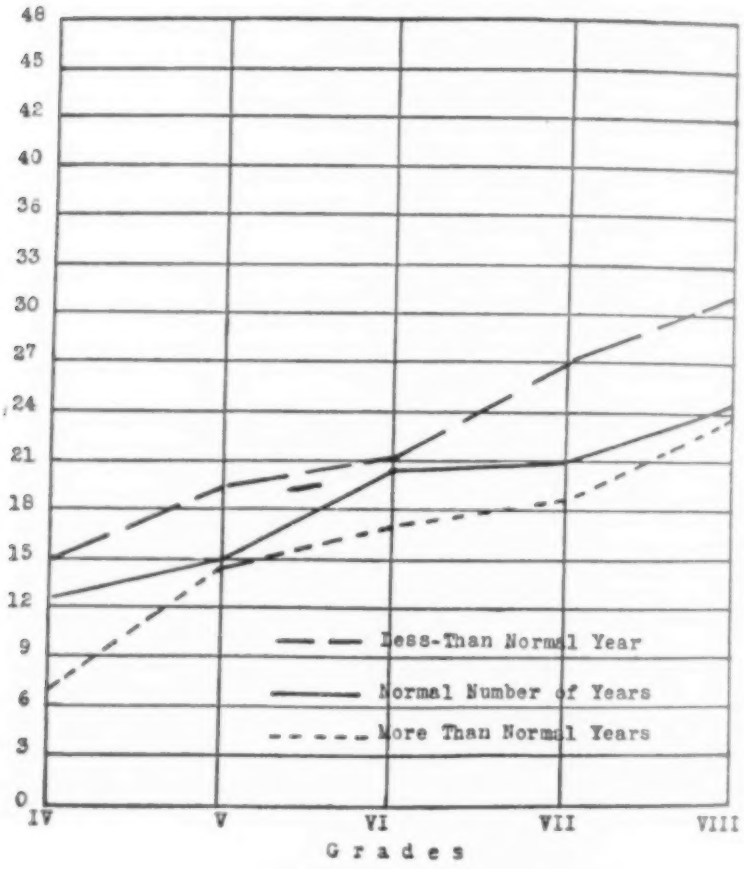

FIGURE 2. COMPREHENSION OF SILENT READING

normal time group the under-age pupils. The former group also shows the lowest intelligence test scores and the latter group the highest. One may infer that the more-than-normal time group is less capable of learning to read than the less-than-normal time group. At least they have not learned to read as well even with from two to six years more practice and instruction in reading.

TABLE II. GROUP SCORES (MEDIANS) IN ARITHMETIC REASONING

	Grade IV			Grade V			Grade VI			Grade VII			Grade VIII		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Number of pupils..	15	99	29	23	129	23	26	106	36	54	112	21	60	101	14
Understanding of principle.....	18.0	12.9	9.0	19.0	17.1	13.7	18.0	18.1	12.4	21.0	19.0	15.0	21.4	17.4	20.0
Correct answer....	11.0	9.6	7.5	12.0	9.6	7.0	11.0	9.7	7.4	12.7	13.1	8.0	11.5	9.5	9.0

There is also a possibility that the methods of teaching reading are at fault, but the same methods employed with one group secure high achievement and with the other group secure a much lower degree of achievement.

The data obtained from the arithmetic tests present a similar situation to that of the reading. Table II shows the median scores for each of the three groups in grades four to eight in both understanding of principle and in correct answer.

It will be noted in this table that the medians for the less-than-normal time group are without exception distinctly higher in both phases of arithmetic than those for the more-than-normal time group. The same interpretations are to be placed on these results as upon the results for reading and the same inferences are justified. The data from the arithmetic tests merely confirm those of the reading tests.

THE STANFORD-BINET TESTS IN SOME ENGLISH SCHOOLS

P. L. Gray *and* R. E. Marsden
Elementary School Inspectors Board of Education, England

Inspectors of the central Board of Education in England cannot spend much time in psychological investigations, since their ordinary official work of inspecting schools must occupy most days. In the last three years, however, we have been able to do something with the Stanford-Binet Intelligence Tests, and Professor Terman has suggested that a brief summary of our results would be of interest to American investigators.

We shall here describe the results obtained from the examination of

(a) 213 children in a large industrial town in Yorkshire,

(b) 71 children in a remote rural district,

(c) 100 children re-tested after an interval of one year, 55 of these tested a third time after an additional year, and 8 of the original 100 tested after an interval of 2 years.

The version of the tests we used was that published by Messrs. Harrap and Co., London. Though this differs slightly from the American version and is said to be suitable for English children, we found it necessary to make the following changes—in VIII-4 we used "Pear" instead of "Peach"; in IX-3, arithmetical problems, we used "Pennies" instead of "Cents"; even then the problems are not quite similar for American and the English children, as 25 pennies do not equal one coin, and we do not usually talk about "25 pennies," but say "Two shillings and a penny." In XIV-4 we used "Bough" instead of "Limb" and in XIV-6 "Change" instead of "Trade."

The full number of tests as laid down by Professor Terman were used for the years III to XVIII. In the test for IX, the alternative was substituted for the first test, since children in school usually write the dates on their books before beginning their written work and the date is asked for in this test. In the

tests for XIV, the alternative was substituted for test 2, and in part of the testing the two alternative tests for XVI were used instead of Nos. 4 and 6. Testing started "at age," and then if all the tests but one in that year were successfully answered the succeeding years were used, if not, the tests below age were employed. This proved sufficient, because the failures below the year at which all but one of the tests are passed proved to be very few in number.

We selected our children by taking whole classes in schools of different social standing in Leeds. In this way we examined 213 children who were well distributed over: (a) the natural ages from 6 years to 12 years, with a few above and below these ages;[1] (b) the "Standards" (a term roughly corresponding to grades in America); (c) the range of intelligence quotients from 70 to 140. In this last respect the distribution of children proved to be a fairly close approximation to that of the so-called normal curve.

The distribution of intelligence is shown in Table I, which also gives the natural ages of the children.

In Table II are given examples of the dispersion of natural ages (N. A.) mental ages (M. A.) and intelligence quotients (I. Q.) in our classes. These two examples, which are typical

TABLE I. INTELLIGENCE QUOTIENTS OF 213 CHILDREN

Age	Number of children	Below 70	70–79	80–89	90–109	110–119	120–140	Above 140
3	1					1		
4	2			1	1			
5	6				3	2	1	
6	21		1	1	14	3	2	
7	20			3	15	2	0	
8	22		2	6	11		3	
9	24				18	3	3	
10	41		2	8	23	5	2	1
11	28		1	7	16	2	2	
12	46	2	9	9	25	1		
13	2	1			1			
Total .	213	3	15	35	127	19	13	1

[1]The children are obliged to attend school at 5 years of age and in Leeds up to 1922 could leave school on their 13th birthday.

of the rest, show that the teachers' difficulties are great with such widely differing children in their classes.

The coefficients of correlation between the I. Q.'s and the teachers' estimates were calculated by means of Spearman's formula for ranks. These varied from .28 to .84 with a median of .63.

TABLE II. DISPERSION OF N.A., M.A., AND I.Q. IN TWO CLASSES

Standard	Number of Children		Highest	75-per-centile	50-per-centile	25-per-centile	Lowest
II	28	N.A. (months)	109	103	100	95	85
		M.A. (months)	144	104	100	87	80
		I.Q.	138	105	99.5	88.5	78
IV	31	N.A. (months)	128	126	123	119.5	113
		M.A. (months)	152	127	121	113.5	106
		I.Q.	126	106	98	91.5	84

All the I.Q.'s of the first 200 children examined in this investigation were redetermined from the results of the short series of tests indicated in the record booklet. The comparison of mental ages calculated from the long and the short series of tests is given in Table III which shows that in 15 percent of the calculations no difference occurs, while in 90 percent the difference did not exceed 5 months. We believe that this result shows the short series to be serviceable for a rapid survey.

TABLE III. COMPARISON OF MENTAL AGES CALCULATED FROM THE LONG AND SHORT SERIES OF TESTS

Difference of M. A.'s (months)	0	1	2	3	4	5	Total 0–5	6	7	8	10	Total 6–10	13	14	Total 11–14
Number of Children	31	40	42	32	24	11	180	9	5	3	1	18	1	1	2

From the results obtained from our 213 town children most of the separate tests appear to be allocated to the proper year. A few, however, proved too difficult for the children of the age at which they are placed in the scale. V-5, Patience, belongs to VI with our children; V-4, Definitions, also belongs to VI;

VII-2, Description of pictures, to VIII; VIII-4, Similarities, to IX; VIII-5, Definitions superior to use, to IX; IX-2, Weights, to X; X-6, Sixty words, to XI. Beyond XII our cases are too small to warrant the placing of the tests. Our investigation places 42 out of 50 tests in the years assigned to them by the Stanford-Binet scale.

We have recently worked up our results with the Vocabulary Test and have re-arranged the words in two new columns according to the frequency with which they were known by all the children we have tested. We did this because after testing 400 children we found that the columns were not of equal difficulty and that the words were not themselves arranged in order of difficulty for our English children.

For the children we have tested the scores denoting the different mental ages given in the Stanford-Binet Revision seem too high. At each mental age up to and including XII our figures indicate that scores of three words less than those given are high enough. All our I. Q.'s are however based on the original scores.

The next part of our report will deal with the use of the tests in six country schools. All of these schools were situated in Yorkshire and were some miles from the nearest railway station. In each instance we tested the whole school population—a total of 71 children. We compared the results of testing these children with the results obtained by testing the 213 town children referred to above. Our conclusions follow: (1) The children in small country schools show practically as much variation in intelligence as do the children in the elementary schools of a large town. (2) The children in country schools when considered as groups show as much variation as do the children in the classes of elementary schools when considered as groups. (3) The children in the country areas are little, if at all, inferior to the children in a big industrial city. (4) The tests, as a whole, are suitable for such investigations as we have carried out.

The last part of this report will deal briefly with the re-testing of 100 children after an interval of exactly one year, with a third testing of 55 of these on the second anniversary of the first

testing, and with a further testing of 8 children after a two years interval. We selected the children for re-testing so as to cover the range of ability and natural age. The same series of tests was given on all occasions, but was carried further when the performance of the child warranted it. We wish to point out that the method of scoring in itself often prevents obtaining absolute equality on all occasions. A child taking the test a second time, after an interval, adds a definite number of months to his mental age, (e.g., 3, 4, or 6), while to maintain his I. Q. exactly only a portion of this number may be necessary.

Table IV gives the changes of I. Q. for the different natural ages, mental ages, I. Q. groups, intervals and sex. The table shows that none of these had any very noticeable effect on the re-testings.

Probably owing to increased experience in giving the tests it was found that the agreement between the I. Q.'s of the second

TABLE IV. I. Q. CHANGES FOR CHILDREN RETESTED AT YEARLY INTERVALS, DISTRIBUTED BY NATURAL AND MENTAL AGES, VARIOUS DEGREES OF BRIGHTNESS, AND SEX

Changes in I. Q.	N. A. at First Test				I.Q. Group			M. A.			Interval		Sex		
	3–6 years	6–9 years	9–12 years	Above 12	Above 110	90–110 I. Q.	Below 90	48–95 months	96–131 months	132–191 months	1 year	2 years	Boys	Girls	Number of children
Above 20	2	–	3	–	2	3	–	2	1	2	3	2	2	3	5
16 to 20	1	1	3	–	2	2	1	2	2	1	2	3	3	2	5
11 to 15	–	5	8	–	3	9	1	3	6	4	10	3	6	7	13
6 to 10	2	14	24	1	6	23	12	14	18	9	27	14	23	18	41
1 to 5	–	19	31	5	6	39	10	12	28	15	39	16	24	31	55
0	1	3	11	1	3	10	3	3	9	4	12	4	8	8	16
–1 to –5	3	22	27	8	14	38	8	11	30	19	48	12	27	33	60
–6 to –10	–	11	1	1	3	9	1	3	6	4	7	6	3	10	13
–11 to –15	2	3	3	1	6	3	–	1	4	4	6	3	2	7	9
–16 to –20	–	1	–	–	1	–	–	–	1	–	1	–	–	1	1
Totals...	11	79	111	17	46	136	36	51	105	62	155	63	98	120	218

and third testings was slightly better than that between the I.Q.'s of the first and second. This is shown in Table V which gives certain comparative data.

TABLE V. RELATIONS BETWEEN TESTINGS AT DIFFERENT PERIODS

Testings	Number of children	Median differences in I. Q.'s	Range of middle 50% of differences	Semi-interquartile range	Coefficient of Correlation
1st and 2d	100	2.25	−2.25 to +7.66	4.95	.887
2d and 3d	55	0.0	−3.03 to +5.0	3.01	.908
1st and 3d	63	3.5	−1.0 to +7.25	4.12	.836
All.....	218	1.6	−2.7 to +7.0	4.85	.883

Editorials

Our genial friend Miles Gloriosus "took in" the N. E. A. Convention at Oakland. He has written his impressions for the readers of the Journal. Pressed for space, we have put him into the editorial department. At this we suspect that our readers will feel an unflattering sense of relief, and that at any rate, when they have read what the Boastful Trooper has to say, they will condone this departure from our usual routine.

The 61st Annual Meeting of the National Education Association Oakland-San Francisco

(A Report by *Miles Gloriosus*)

Any program needs courage to make it successful. One of the most inspiring experiences that can happen to any audience is to hear a courageous spirit that is able to express itself—no matter what the audience or the speaker or the subject. A great many of those who had the privilege of hearing Miss Florence M. Hale at the meeting of the National Education Association last July hold that she delivered the keynote address of President Owen's program.

Although Miss Hale's task was to present but one angle of "The Changing American School Program," as outlined by President Owen, the lady who is State Agent for Rural Education of Maine spoke from the standpoint of the rural school in such a manner and with such power that the university, state, and city school people present listened with at least the same degree of interest and inspirational profit as any rural teacher in the audience.

Instead of sitting in the wailing seat and bemoaning the parlous condition of rural education, Miss Hale took the other tack and gave an eloquent description of the courage and determination and resourcefulness displayed by many handicapped teachers in the rural schools. Miss Hale is that sort of woman herself and therefore she was able to put force into her remarks that took her audience by storm.

There is something about a well told tale of heroism that brings tears to the eyes of many people. This tearful tribute is not necessarily caused by the pathos of a struggle against odds; instead, it is just as much a sign of admiration as handclapping, lachrymose though it be in form. I was glad I sat in the back seat of the gallery when I found myself choking up after listening to Miss Hale's account of some of her experiences amid the pine-clad rocks of Maine. But when I saw Arthur Chamberlain blowing his nose in the second row from the front and when I saw many other men doing likewise in various parts of the house, I didn't feel so foolish.

There is little, if any, doubt that President William Bishop Owen produced one of the strongest, most constructive programs ever given at a summer meeting of the National Education Association. Gone are the years of reconstruction in which President Owen displayed the leadership which wrought the association into a cohesive, nationally representative organization ready to do a national work. Past are the forty years of wandering in the wilderness; knitted together in an effective unit, the hosts of the chosen gathered around San Francisco Bay prepared to begin smiting the Canaanites hip and thigh. By the way, they began one and all by taking a rap at Comrade Pritchett. Though Caleb and his fellow scouts tell us that there are giants in Canaan, the members of the N. E. A. appear to be acting on the assumption that the bigger they are, the harder they fall. Almost without exception, every speaker in the general sessions made some cogent remarks on the Pritchett report similar in tenor to the sentiments so clearly expressed by Doctor Buckingham in the issue of the *Educational Research Bulletin* for May 30th.

SUNDAY EVENING PROGRAM

While I enjoyed the music furnished by the Hawaiians I was puzzled over the fact that everyone in the audience rose and remained standing when the last song of the series was sung. Maybe it was the Hawaiian national air. I shall have to ask President Owen. You understand that, not wishing to appear odd or discourteous, I stood with the rest. One reason for my skepticism, however, is my recollection of a church vesper service in Illinois when the audience stood through "The March of the Magi" under the impression that it was "The Star Spangled Banner." That was before the war. Be that as it may, some time I should like to hear the young Hawaiian tenor take the part of Rhadames in "Aida."

Frank F. Bunker, executive secretary of the Pan-Pacific Union, gave the principal address of the evening and I regret that he did not give it last spring so that it could have been printed in the *Journal of the National Education Association* in the same issue of that periodical containing the unfortunate cartoon depicting a soldier as a modern beast. Doctor Bunker's address would have given us a wholesome interpretation of the cartoon.

He described the shrinkage of the world, both in its physical aspects and in its human contacts. To illustrate his point he showed the length of time that was taken in former days for important news to reach Hawaii. On the other hand, when he began to pack his trunk in Honolulu in preparation for his trip to the N. E. A. meeting he couldn't find his dress suit. Going to his telephone he called up the wireless operator and sent an S.O.S. message to his wife who was in Berkeley. The next morning he received a reply which said, in effect, "Never mind the dress suit. Bring my hat trunk." Apparently his dress suit was gone beyond recall since Doctor Bunker wore a dinner jacket when he made his address. Probably some Kanaka made away with it. Anyway, the world is smaller.

Doctor Bunker then illustrated the jungle method of settling differences by telling how rabbits had driven off all birds from one of the little islets of Hawaii and had afterward increased

so fast in numbers that they had turned to cannibalism among themselves, so that travelers voyaging to the island afterward found nothing but numberless rabbit skins.

Equally futile and unsatisfactory from the standpoint of human progress is the method of separation and isolation. This method worked with some degree of success in the times of Abraham, but with the shrinkage of the world caused by modern methods of communication and transportation, separation and isolation have become antiquated.

With such illustrations Doctor Bunker demonstrated the necessity for organizations like the Pan-Pacific Union as types of the modern method of furthering human progress.

He was followed by President Henry Noble McCracken of Vassar College who had just returned from a victorious European speaking tour of many months' duration. Doctor McCracken has a pleasing personality and doubtless he made a great many friends for the United States of America during his trip. He gave the members of the N. E. A. a number of his impressions of the results of the work that is being done by the Junior Red Cross in Europe. The last speaker of the evening was Vaughan MacCaughey who had as his subject "Education in Hawaii." The evening closed with a series of pictures shown under the auspices of the Pan-Pacific Union.

THE BIG NIGHT

The great meeting of the week, in my judgment, took place on Monday evening when President Owen gave the association its job for the coming years. He intimated that, since the National Education Association has at last become an articulated, well-organized instrument, it should have something definite to do. At the same time its task should be great enough to be worthy of its vast potential powers.

Thereupon he outlined "The New American School Program" which calls for a thorough study of the steps that must be taken to furnish American children a complete education from the kindergarten through the college. This calls for a study of

the ways by which our educational structure can be built up, step by step, to bridge the gaps that now exist between the elementary, the secondary, and the collegiate courses. It doesn't take long to state the problem in a nutshell, but believe me it is some problem.

In his wake Professor George Drayton Strayer came bringing his well-known bundle of statistics and, after taking a well-aimed shot at the common target, namely the Pritchett report, he plowed into the problem of "The Financing of the American Schools." The future has no terrors for the popular and hard-working ex-president of the Association and his address will be of interest to all school administrators when it is published.

Professor James Fleming Hosic then took the stand. During the school year Doctor Hosic is Director of Extra-Mural Courses of Teachers College, Columbia University. In the whimsical and seemingly nonchalant manner that becomes him so well, James made a mock protest at the propensity of school people to hold meetings on any and all occasions. He pretended to be particularly concerned over the association's habit of meeting in the summer when so many teachers are in summer school. For his own part, he had an alibi because he was teaching in the summer session at Berkeley which is only eighteen cents' worth distant from San Francisco and scarcely less than 'arf of that from Oakland.

"In all this furore of meetings," however, Professor Hosic attempted to get some benefit for the furtherance of President Owen's changing American school program. His suggestion to the state teachers associations, at least to such as are representative organizations, was that the leaders formulate a program of action that would extend over a five-year or a ten-year period. Such a program could be launched at the winter meeting, could be carried through the district meetings, and followed up by the state school journal; and in this way the state associations could be of important assistance to the aims of the national association.

During the course of his address Doctor Hosic made some remarks that might lead the unwary listener to assume that the

founder of the National Conference on Educational Method was just a wee bit doubtful as to the efficacy of intelligence testing and, for that matter, of other newer aspects of research as well. In fact, he warned teachers and teachers' associations to get their advice from leaders of proved experience, adding in his bantering tone, "We have a number of young students of education who are not hampered by experience."

RESEARCH, THE BASIS

Then up rose Dr. Charles Hubbard Judd. He was introduced by President Owen to address the association on the subject "Educational Research and the American School Program" but, as the Director of the School of Education of the University of Chicago strode to a place before the speaker's table, he exclaimed with a smile behind his tawny beard,

"I came here wondering what I was expected to say regarding the relation of educational research to the school program but, as I sat here this evening, it seemed as though I was expected to be one of those who was not hampered by experience."

There was a roar of laughter at this from all over the hall and Doctor Judd added, "I've received a lot of experience this evening, though."

"To those who are interested," he continued, "I extend an invitation to take a journey," and he held up a heavy bundle of manuscript, "Yes, to those who are interested in educational research I extend an invitation to read this paper—when it is printed."

With that he laid his manuscript on the table behind him and launched into an address that was tinged and lighted with the same sort of courage and fire that characterized Miss Hale's speech.

He showed that the American people, from the beginning of their history as an independent nation had established the principle that they would not be ruled or directed by imposed power from above, whether royal or aristocrat. As a consequence, the only balance wheel on which we as a nation can rely is research.

Doctor Judd was at his best and his voice rang through the great auditorium as he deployed his illustrations and brought them up on the line to support his point. He brought down the house when he told of the old cartoon representing the world dressed as a working man meeting a sweet girl graduate. "Who are you," asks the world. "Mary Jones, A.B." replies the miss demurely though proudly. "Come with me," says the world, "and I'll teach you the rest of the alphabet."

Farther along Doctor Judd gave an English illustration which our billiard players would probably regard as reverse English. In 1913 Doctor Judd was visiting schools in England. He noticed that a new and universal system of physical training was being installed, evidently on orders from higher up. In his tour through the provinces he noticed that this new system was not getting the hearty response and co-operation it might have had.

Finally he reached London and, in the course of time, met the particular member of the Board of Education who had charge of installing this new system of physical training. Without saying anything about his own observations of the system, Doctor Judd asked if it was succeeding. The board member replied that it was. When the American visitor inquired into the board member's method of learning how the system was working out, the latter said that he had inspectors who made regular reports. Doctor Judd then pointed out that inspectors were sometimes fallible and he asked how checks were made on the inspector's reports. The member did not seem to understand and Doctor Judd suggested that in like cases it was sometimes the custom to take measurements and physical examinations of the pupils from time to time to determine how the course was affecting them. No, nothing like that had been done.

"Then," asked Judd, "How do you know it is succeeding?"

"Oh," replied the board member in a relieved tone, "Sometimes I go down myself and see."

Quite simple, eh what?

"There are times," continued Doctor Judd, "in American school investigations when I'd like to 'go down myself and see'."

When he asked the reason for the sudden installation of the course in physical instruction the board member replied,

"You see, I'm an army surgeon and I have received orders to put the young men into condition in the event of war."

Until I heard Doctor Judd I had supposed that the Great War caught England by surprise.

Whether for good or ill, no such arbitrary action could be taken in the public schools of the United States of America as long as we maintain the principle of self-government. Indeed, at its worst, as Judd jocularly explained, "There isn't an American community that hasn't the right to show all the stupidity it wants to!"

Carrying this principle over to the public school system, Doctor Judd demonstrated forcibly and beyond peradventure that research is the source on which our public school system depends for guidance. Faulty it may be at times, but it is ever improving and with its improvement comes improvement in educational method and results.

There is no civilized nation under the sun that has poorer, more meagre central direction of education than we have. We used to borrow our educational principles from across the seas but we have since seen that we must establish principles that are applicable to American education. American schools will not be governed, any more than any other American institution, except by reason. That reason is supplied by research.

Among the great efforts in research that have affected American education directly or indirectly, Doctor Juud referred to the child study instituted by G. Stanley Hall and his students, and to the work done by such men as Rice, Thorndike, Ayres, Bobbitt, Charters, Gray, and Freeman.

As to surveys, he recommended that they be restricted to specific studies, as for example Strayer on school buildings.

In conclusion Professor Judd made certain pleas; the time has come when a new movement must be developed; American research must become co-operative research, making a broad, comprehensive survey that will lead to the enrichment of the cur-

riculum, and that will enable the association to lay before the American people policies that will be sound and that can be developed. Doctor Judd received a great ovation when he completed his address.

President Owen's program was ably developed on Tuesday evening when Dean Ellwood P. Cubberley spoke of the American school program from the standpoint of the nation, Dr. Thomas E. Finegan spoke from the standpoint of the State, and Superintendent Ettinger spoke out of the poignant memories of his dealings with boards of education, from the standpoint of the city.

GREAT WELCOME

Both Oakland and San Francisco showed a hospitality that won the hearts of the delegates. The newspapers of both cities devoted a profusion of space to accounts of the convention. Rand McNally and Company and the Milton Bradley Company assisted by giving every member visitors' guides to San Francisco and Oakland. Here and there were N. E. A. visitors who followed the example of the elderly lady who hadn't crossed Market Street for twenty years because the prospect of traversing that four-track thoroughfare was too terrifying. Most of us, however, rejoiced in the remarkably high degree of courtesy displayed by the street car men and went any and everywhere. I don't, for the life of me see, though, how a San Franciscan can get any thrill out of climbing Pike's Peak or the Matterhorn or Mount Everest. Anyone who thinks nothing of strolling along Powell Street or California Street or any number of other streets in San Francisco is an unusual person. I got so that I could do it myself after a few days. I haven't mentioned the visits to the battleships, the Greek theatre in Berkeley, and the view from the Sather Tower but the reader will understand that the words "Welcome N. E. A. 1923" grown in foliage in Golden Gate Park meant welcome in every sense of the word throughout all the cities around San Francisco Bay.

Reviews and Abstracts

PUBLIC EDUCATION IN INDIANA. *A report of the Indiana Educational Commission.* New York: The General Education Board, 1923. 304 pp.

The report of the Indiana Education Commission consists of sixteen chapters—ten devoted to conditions as they were found in Indiana's educational system and the remaining six chapters to a discussion of needed improvements. The first part deals with fundamental problems: "Instruction and Pupil Progress in Elementary Schools," "High-School Instruction," "Training Licenses and Salaries of Teachers," "Teacher-training Institutions," "Buildings," "Grounds and Equipment," "High Schools," "Vocational Education," "Local Administration," "State Administration," and "Financing the Schools." The report criticises severely the township system of organization, the blanket courses for teachers offered in teacher-training institutions of the State, the failure of the State licensing system to encourage professional growth of teachers, lack of adequate State supervision, inefficient handling of State school funds, and the political influence surrounding the state superintendency.

To remedy the conditions as found, the report groups its recommendations under six general headings:

1. The state board of education should be reorganized to consist of the state superintendent and six lay members. The salary of the state superintendent should be made commensurate with the salary of the highest paid educational officials of the state. The state superintendent should be made the executive head of the board of education and be given an adequate professional and clerical staff.
2. The township school system should be abolished and a county system established in its stead. The county superintendent and an elected board of education should have control of all the schools of the county not under the direction of state or town boards and such restrictions should be placed on the town schools as would force all the small schools into the county system. All large town and city school systems should be administered under a single school code.
3. In terms of a detailed study of three counties, plans were worked out for a better organization of schools based on the proposal that the county unit be consolidated into six-grade elementary schools, nine-grade schools and twelve-grade schools. The proposed organization definitely provides for the junior high school in all nine- and twelve-grade schools.
4. The proposed system for licensing teachers should provide as many kinds of licenses as there are types of work calling for special and prolonged training and should promote professional study. A minimum salary scale is also suggested.
5. The report urgently recommends the elimination of overlapping of functions in the several state supported teacher-training institutions;

the establishment of courses designed to fit teachers for special purposes; the changing of university requirements to fit graduates for teaching more than one subject; and a program of reorganization for the Terre Haute and Muncie Normal schools, part of which was put in operation before the final report was published.

6. The committee advocates a considerable increase in the state's financial support of schools; the handling of the congressional and common school fund as a revolving school fund to promote building in the poorer communities; and general distribution of school funds according to the following plan: One-half on the basis of wealth back of each child to be educated; one-eighth on the basis of school census; one-eighth on the basis of school enrollment; one-eighth on the basis of aggregate days of attendance; and one-eighth on the basis of full-time teachers employed.

The report of the Indiana Commission is a readable volume. It should do much toward leading Indiana to retain the great educational prestige that it has so nearly lost.

J. CAYCE MORRISON

Ohio State University, Albany, New York

FERRIS, EMERY N. *Rural school survey of New York State. The rural high school.* Ithaca, N. Y., 1922. 186 pp.

The data on which this book is based were obtained from three sources: (1) statistics of the State Department of Education; (2) replies of 405 principals to a questionnaire; and (3) visitation of over 75 rural high schools situated in all sections of the state.

Part I of the book deals with organization, administration, and supervision, the survey of which was carried on under the general direction of Dr. C. H. Judd. Part II deals with the teaching staff, classroom instruction, and the curriculum; and this part of the survey was under the general direction of Dr. W. C. Bagley.

The schools studied were situated in centers having a population of 4,500 or less—70 percent of the schools being in centers of 1,000 or less and 84 percent having an enrollment of 100 or less.

Many interesting facts were brought out by the survey. Among these may be mentioned the following: With the exception of athletics, only 180 out of 405 high schools reported extra-classroom activities. Over 75 percent of the buildings lacked an auditorium. The median class in schools with enrollment under 50 was 6.8 and in the schools of 50 to 99 pupils the median class was 11.6. In the smaller schools 46 percent of the teachers were engaged for 8 periods or more each day in teaching classes and in study-room supervision.

The system of regents examinations is assigned as the cause of many defects in organization and teaching. This system tends to discourage extra-curricular activities; it increases the number of failures of pupils; it gives little opportunity for initiative on the part of principals and teachers; it formalizes instruction and over-emphasizes mechanical drill; and it tends to make principals and teachers lose sight of real objectives.

A few pages at the end of the book are given to a discussion of principles underlying the organization of the rural high-school curriculum. Individual and social efficiency are given as the ultimate aims of high-school instruction, and on these bases ten objectives are proposed to be made use of in working out more specific objectives.

The book contains many statistical tables and graphs. The recommendations made in connection with each division of the survey are valuable from the standpoint of practice. The book is worthy of study by both principals and high-school teachers.

GEO. B. WEISIGER

Oakland, Illinois

MORRISON, HENRY CLINTON, and others. *Studies in secondary education, I, University High School, University of Chicago.* (Supplementary educational monographs, No. 24, January, 1923) Chicago: University of Chicago, 1923. 150 pp.

Although criticism of secondary education in the United States is still frequent and doubtless deserved, there is going on in all sections of the country earnest and skilled experimentation that surely leads to improvement. These studies report some of the work at the University of Chicago High School; and it is to be hoped that the first volume is a precursor to many others.

This volume of nine chapters is introduced by a careful and highly commendable outline of the types of experiment undertaken by the Laboratory Schools and their natural limitations. In the concluding half of the chapter Superintendent Morrison reports the success that has attended his efforts to shorten the period of secondary education from six years to five and at the same time introduce some junior college work. This report should stimulate other schools with superior teachers and pupils to make similar efforts toward shortening the course.

The remainder of the volume contains two chapters by W. C. Reavis and Elsie M. Smithies on the plan of studying and directing the pupil who is, for some reason, maladjusted to the school; a report by W. L. Beauchamp of the results of directed study in elementary physical science; outlines of a two-year sequence in high-school history by H. C. Hill and A. F. Barnard; a sketch by E. R. Breslich of the development of correlated mathematics, with successful results as measured by the marks of pupils in the high school and in the university; and an interesting final chapter by E. F. Hanes and Martha J. McCoy on a liberalized course on English literature.

Just as Superintendent Morrison's chapter should stimulate attempts to abbreviate the length of the secondary school period, so the other chapters should encourage teachers to modify and enrich the content of the courses. The old obstacle of college requirements to reform is now much less than the unwillingness or inability of secondary school teachers to depart from traditional subject-matter and method. The volume issued by the University of Chicago Laboratory Schools is worthy of wide and serious study.

THOMAS H. BRIGGS

Teachers College, Columbia University

BEATTY, H. M. *A brief history of education.* London: Watts and Company. 1922. 184 pp.

This is an attempt to place educational movements in their due perspective and is in no sense an attempt to write a history of education. The author tries to proportion the material according to the viewpoint of its applicability in modern practice or its use in an appreciation of the survivals from the past. He says, for instance: "Greek education is the first which appeals to us and helps in the solution of modern problems; it is also the first which we can clearly visualize with the aid not merely of written records, but also of inscriptions and vase paintings. Its influence on education as an institution has been far less than that of Rome, but as a fermenting energy much greater; and, more than that, the Greeks were the first and till our own day the only people who treated education on its merits and without prepossession." Hence the author gives a rather full elucidation of Greek education.

The red threads running throughout the volume are set forth by the author in the following: "The progress of education is determined by elements—metaphysical, sociological, and psychological. The first embody the aim and disclose the ultimate reality, which determines the end of education. The sociological elements are those that bring education into connection with the life of the community, of which the school is a part and for which it serves as a preparation. The psychological element is concerned with the mental life of the pupil."

In a rather sketchy manner there is indicated the contribution made by different nations and periods to educational thinking and practice. These broader generalizations indicate a thorough knowledge of the subject matter of education but carry with them a certain English bias. The characterizations of certain periods are clever. For instance, in the later Roman periods it is said that, "under a centralized bureaucracy rhetoric and machinery took the place of thought, originality, and taste."

Apparently the author fails to see the good there was in the education of the middle ages, except that which obtained in the Moorish schools. There is also a rather clever interpretation of certain leaders such as Vittorino. He sets out the school of Vittorino incisively and with a high degree of appreciation of the true spirit that was in the Renaissance. Certainly the place given to Pestalozzi seems to be out of proportion to that given to Rousseau. However, this may be American bias in favor of Rousseau since we have felt his influence most profoundly, perhaps, through the writings of Dewey. It would be hard, however, to justify his depreciation of such leaders as Luther, from the standpoint of Luther's contribution to the democratizing of education, and also such a sweeping generalization as, "Rabelais had no influence on the current school practice."

In the section dealing with German education there is a rather sympathetic treatment. We find, however, an appreciation of the meaning of formalized instruction as it was carried out in the Prussian schools.

To the American there seems to be a strange omission of the development peculiar to the United States.

It would seem that the purpose of the book might better have been attained if there had been less of the cataloging of facts and more of such an interpretation of facts as would aid constructive thinking.

A. O. HANSEN

State Normal School, Bloomsburg, Pennsylvania

FINLEY, CHARLES W. and CALDWELL, OTIS W. *Biology in the public press.* New York: The Lincoln School of Teachers College, 1923. 151 pp.

The booklet at hand is an interesting and successful effort to determine what kind of information on biology the public is securing through the medium of the press. Such a determination is desirable not as a guide to follow but as a basis for determining how far educational influences may utilize present conditions and to what extent it is necessary to reconstruct or supplant them. As the authors state "it is difficult to over-estimate the potency of the modern newspaper."

The book contains in the first place a good analysis of the contributions of the modern newspaper in the biological field. It appears that in the papers studied less than one-half of one percent of the articles were devoted to fictitious biology. Evolution claims 2 percent, general nature 3 percent, organizations of producers 4 percent, food 18 percent, plants 23 percent, animals 25 percent, and health topics 30 percent of the total space devoted to this field.

Few if any problems are more definitely related to the welfare of the nation than its health and it is inspiring to note that this topic has received major emphasis. Nearly as much space is devoted to other animals than man but the evident motif in nearly all of these is those conditions in animal life that pertain to the welfare of the human species. Plants are treated under much the same headings and the significance of food problems appears in the amount of space devoted to it. The remaining problems occupy less than 10 percent of the entire space devoted to biology.

In general comment the authors call attention to the strictly commercial character of much of the biological knowledge; and while they observed both gross misstatements of facts and some tendencies to present as controversial matters that are scientifically not in question, yet on the whole the study impressed them with the reliability and high standard of the material furnished. So much so that they venture the statement "newspapers appear to be much more up to date in things biological than our college and high-school texts on the subject." Since texts must contain material that has been carefully worked out they could hardly be expected to include discussions of new information not yet firmly established.

Finally the authors suggest that "possibly the press would publish and the public would like to read much more biological material of much wider range if it were made available." "The biological articles listed are surely thought to relate to genuine public needs or interests." "Teachers should use many of these type articles," for "if biological study is to improve liv-

ing and thinking it needs anchorage in specific situations which are meaningful to the students."

The authors might well have recorded the establishment of Science News Service, a commercial enterprise which undertakes to furnish reliable and thoroughly up to date information to the press on any scientific problem. The large and growing demand for this service demonstrates beyond question that the newspapers and the public are alive to the significance of biological information and seek to get the most authoritative utterances that can be obtained.

HENRY B. WARD

University of Illinois

GOODSELL, WILLYSTINE. *The education of women, its social background and its problems.* New York: The Macmillan Company, 1923. 378 pp.

Volumes which discuss the education of women are always timely, for this is a subject upon which thinking people are always in controversy. Prof. Goodsell presents a brief history of the education of women in the past, but devotes the major part of her book to the problems of education which confront women now. These are presented in a chronicle of opinion, with a wealth of quotation from those who have reflected most ably upon the sociology of womanhood. The author examines the opinions critically, and brings to bear upon them the results of quantitative investigation, whenever such data are available.

The central problem of the education of women is clearly recognized—how to open the biological puzzle-box, which involves the difficult combination of ability and desire for vocations other than housekeeping, on the one hand, with a cumbersome reproductive system, on the other. In consideration of this central problem, and of all the minor problems that radiate from it, Prof. Goodsell discusses *College Women and the Marriage Rate, Sex Differentiation in Education, Sex Differentiation from a Social View-Point, Cultural versus Vocational Education, The Vocational Education of Working Girls, The Social Education of Women, Manners and Morals,* and *Health and the Woman.*

Especially stimulating is the chapter on *Cultural versus Vocational Education,* in its honest description of the bewildered college girl, when she discovers that her B. A. degree has not fitted her to "do anything." "Young women at the close of an expensive college course covering four years, not infrequently wake with a start to the disturbing fact that they are quite unfitted to earn their living in any skilled vocation." Certainly, young girls of ability to enter college should be more clearly informed than they now are, previous to entrance, that the liberal arts colleges do not train for vocational careers.

Dr. Goodsell looks forward ultimately to a satisfactory solution of all the problems treated. "The future of the education of women in America is big with hope and promise. It is the author's belief that the widening of opportunities for women, both educational and social, the gradual breaking down of the traditional conception of woman's nature and woman's sphere, will proceed without serious hindrance."

The book is a scholarly contribution to the study of a topic too often insufficiently considered in teaching the history of education. As such it will find place in the libraries of education. As a volume of general interest, it will also be added to the libraries of many who are not professional teachers.

LETA S. HOLLINGWORTH

Teachers College, Columbia University

JUDD, CHAS. H. and others. *Administration and supervision.* (Rural school survey of New York State) Ithaca, N. Y.: Cornell University, 1923. 629 pp.

This review of the Rural School Survey of New York State—Administration and Supervision—by Doctor Charles H. Judd and others is one of the real contributions to the solution of the rural school problem. It is primarily a discussion of the situation in New York State, yet it is applicable to any rural school situation to be found in the entire country. The high personnel of the contributors insures a discussion in the broadest and widest sense. The experience of each man in his particular field is such that this report comes with authority.

The history of the New York school situation as it has developed through the school district, the school meeting, the trustee, the district superintendent, the county superintendent, and the State Department of Public Instruction, is carefully traced, and the relation of each is shown to the community.

It is shown how the small district unit has become impoverished both in wealth and the number of children. It is also shown how the local power of the district board, with its opportunity for interference by personal feeling, family and community differences, personal domination, and various other petty grievances, often results in an impoverished school curriculum, a dilapidated building, little or no equipment, and the employment of the cheapest kind of teacher.

Part two, "The Supervisory District," shows the actual practise in rural-school supervision in New York as influenced by the lay element, exerted directly in the school itself and indirectly on the professional officers connected with the system.

Part four is especially applicable to the rural-school situation over the entire country since it is devoted to the principles of organization and administration. There is a tendency to reiteration in the various chapters but after all, the fundamental principles of organization and administration are emphasized throughout.

Part five, "The State System of Examinations," is devoted primarily to the discussion of the system in New York. It is maintained that when promotions and ratings are placed wholly upon examinations very false conclusions are the results.

Part six, "Community Unit," applies over the entire country. In fact, you would think that Doctor Works was discussing the general situation rather than the situation in a particular state. He shows here very conclusively that when "once an elaborate system has been established, fresh justification is

sought and usually found for the perpetuation of the system after the original purposes have been abandoned." The "Community Unit" is regarded as the logical and ideal unit for school administration with lay control and professional supervision and guidance.

Doctor Judd in Part nine expresses the situation in a nutshell when he says, "What is being done well today is being done in the face of unnecessary obstacles and much that ought to be accomplished is impossible at the present time because of defects in organization which can and should be remedied." He would place the responsibility of the rural school largely upon the state for "Pupils are compelled to go to school by state law and parents are not allowed to keep children at home. On exactly the same grounds the state will not allow a community to decide whether or not it will open a school. Nor does the state allow a community to drop below a certain minimum in the number of days school shall be kept open."

The State cannot dodge its responsibility. At the same time, it must influence the schools through advice and by working with the community rather than working for it. This "Administration and Supervision" is a real contribution to the problem of the rural school.

LEE L. DRIVER
State Department of Public Instruction, Harrisburg, Pennsylvania

MARVIN, CLOYD HECK. *Commercial Education in Secondary Schools.* New York: Henry Holt Company, 1922. 216 pp.

If the literature of the field is to be taken as a criterion it must be said that thinking in commercial education has been very fragmentary. Until recently no outstanding books have appeared since Cheesman A. Herrick wrote his excellent volume on the Meaning and Practice of Commercial Education in 1904. The appearance of two noteworthy books on commercial education in the same year, 1922, indicates that the trend of thinking on this phase of education is changing.

It is commonly assumed that everyone understands the meaning of "commercial education." Professor Marvin, however, makes no such assumption and specifically defines it in terms of training for the production of economic utilities. In defining the term, he states five aims, or objectives, for commercial education: (1) to give the proper physical foundation; (2) to give an appreciation of the finer attributes of life; (3) to create the ability and desire to join the work of the community; (4) to give a knowledge of the social and economic values of commercial education; and (5) to train for technical commercial occupations.

Approximately one-fourth of the entire book is devoted to the "Development of Tendencies in Commercial Education," in which the history of education for commercial pursuits is traced from the training of apprentices in the Middle Ages through the revival of commercial education by private business schools early in the 19th century to the modern commercial education of the American public school. Statistics are presented to show the present enrollment in public high-school commercial courses, the percent of pupils en-

rolled in the commercial classes of twenty-one cities, and the proportion of the school budget spent on commercial education in several cities. After a careful analysis, the author reaches the conclusion that we have "need of clearly defined aims and clearly established principles for commercial education." He also emphasizes the need of a complete program of vocational guidance, placement, and follow-up in the public schools.

According to Professor Marvin, the commercial curriculum should be built around the social studies as a core. Apparently he agrees with the Commission on the Reorganization of Secondary Education that the early years of the commercial curriculum should not only lead naturally to the later years of the curriculum, but also be of value to those who must leave school at the end of any school year. For a different point of view, the student should read Professor L. S. Lyon's book on Education for Business.

The last part of Professor Marvin's book is devoted to a discussion of the problems in part-time commercial education and evening classes, in which the development of various types of schools under each heading is traced. Considerable emphasis is given to the need of establishing both continuation and evening-school classes on the "short-unit" basis.

While it may be said that "little that is new" is presented in this book, certainly it merits the careful consideration of all who are interested in the program of commercial education. To say that the raw materials out of which a book is constructed are not entirely new is not to disparage the work in any sense if, as in this case, those materials are presented in new and more effective ways.

J. D. RUNKLE

Ohio State University

LENNES, N. J. *The teaching of arithmetic.* New York: The Macmillan Company, 1923. 486 pp.

In the preparation of his book, Professor Lennes has read widely. Footnote references and quotations indicate that his material has been gathered from a great number and variety of sources. In this volume there is probably more of the literature of arithmetic teaching, quoted and summarized, than in any other book.

Part I contains four chapters: Formal Discipline, Methods of Learning and Teaching, Motivation in the Early Grades, and Motivation in the Grammar Grades. Part II, including twenty-five chapters, offers suggestions on teaching the various portions of an eight-year arithmetic course.

Assuming that this book is for use in teacher-training classes, to begin with a sixty-six page discussion of Formal Discipline is a bit unusual. One wonders what will be the attitude of the normal-school student who is not yet aware of the existence of the quarrel between the conservatives and the practicalists as to the content of the course of study in mathematics in the upper grades and the high school.

Teachers of the first four grades will find in this book very little in the way of helpful suggestions bearing upon their problems. In addition to the chapter on Motivation in the Early Grades, there are but two dealing directly

with the work of these grades. Most of the remaining four-fifths of the book is written primarily for teachers of the grammar grades. Chapter VIII Common Fractions, dismisses all work with fractions prior to the fifth grade in an eight-line paragraph.

Several of the chapters seem to the reviewer to be deficient in specific suggestions. In the chapter on common fractions, for example, one wonders after reading what the author has to say about Least Common Multiple, just what should be done about it. The suggestions offered in Chapter IX for introducing decimals seem weak and meager.

The chapter dealing with numbers and number combinations is good in that its suggests a gradation of combinations according to their difficulty, objects to serial memorizing of addition and multiplication tables, and insists upon complete, automatic mastery; it is, however, weak in the psychology of habit formation. For example, there is no suggestion of the amount of practice needed on the fundamental bonds, nor, more seriously, of how this practice should be distributed.

As the reviewer sees it, we need books on the teaching of mathematics written from the point of view of the 6-3-3 plan of school organization. The author, in discussing the problems of the teacher of arithmetic in the upper grades, performs a task which has already been done very successfully several times. Had he recognized the acute character of the problems of the teacher of mathematics in the junior high school, his contribution to educational literature would have been larger.

R. L. Morton

Ohio University

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Doctor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

The Bureau of Publications, Teachers College, Columbia University, has just issued "Standards for Elementary School Buildings" by Strayer and Engelhart. This booklet provides in very compact form a detailed description of standard equipment and provisions which will make possible an agreement in scoring buildings by different individuals.

The World Book Company has announced the publication of the Ruch-Popenoe General Science Test. The test is designed primarily for grades VIII and IX, and has two forms of approximately equal value. It consists

of two parts, the first of which has 50 sentences of the multiple choice variety, and the second 20 diagrams which measure the ability of pupils to identify apparatus and to apply principles of science to the solution of problems.

A Bouquet

Bouquets so seldom come to editors that one such as the following is greatly appreciated:

I feel compelled to write you this expression of genuine appreciation of the news items and communications included in the *Journal of Educational Research*. After reading the pages included under this heading in the March issue, I was particularly impressed with the unique value of the information which you have made available through this means.

Yours very truly,
R. A. Kent,
Dean, School of Education
University of Kansas

We sincerely hope that many of our readers feel that the department is justifying itself in the information which it makes available even though they have not been "compelled to write" about the matter.

County Superintendent J. F. Unger of Cumberland County, New Jersey, reports that 264 pupils were transported by wagon; 1,072 by automobile; 111 by trolley; 142 by train; and 46 by individual transportation. The average costs were 65 cents per month per pupil mile to transport by wagon; 56.2 by automobile; 33.3 by trolley; 34.2 by train; and 36.0 individually. Trolley and train transportation are both cheaper than automobile, but in most cases cannot be employed because they do not exist in the district needing transportation, or because schedules will not fit the needs of the schools.

The Wilson Language Error Test by G. M. Wilson, professor of education at Boston University, represents another effort at the measurement of children's knowledge of correct language forms. The test consists of three stories, each of which involves 28 language errors. The errors were selected on the basis of extensive studies of language errors made by grade and high-school pupils. The child must recognize the error while reading the story and be able to draw from his own knowledge the correct form to substitute in the place of the incorrect. The test is partially standardized, and tentative median scores for grades III to XII, inclusive, and for ages 7 to 20, inclusive, have been set up by the author. Published by the World Book Company.

Dr. Meleney, associate superintendent of New York City has recommended to his principals that this year the lowest rated 20 percent of the pupils in the high schools be permitted to carry not more than three prepared subjects. These subjects would be English, Civics, and a science, either General Science or Biology. Where equipment permits, the children may carry typewriting or shop work, and in all cases are to be given a study period with a teacher who is able to help them with their three major subjects. The ex-

treme percent of failures in January, 1923, of 22.5 in Modern Language, 24.5 in Latin, and 28.2 in mathematics, was largely influential in calling forth this recommendation.

Superintendent U. L. Light, Barberton, Ohio, has recently furnished us with a copy of his mimeographed report on measurement in the Barberton schools. This report covers the second semester of the school year 1922-23. The report gives a brief explanation of the statistical terms used, and a detailed report on various tests, showing the central tendencies for each grade group and the standard score. Those who may examine the report for a general summary, showing the relative standing of the Barberton schools, will be disappointed because no such summary is given. The report would be of more service as a supervisory instrument for improving the work in the various classes if more remedial suggestions were given in each case.

We have received from Cassie R. Spencer, supervisor of elementary education for the State of Alabama, a report of reading tests made in six counties in that state, three of which have supervision, and three of which have not. An analysis of the results shows an advantage in grades III, IV, and V in the supervised counties; while in grade VI the results in the unsupervised counties are either equal to or greater than those in the supervised. An attempt should be made to discover the cause of this situation. Suggested reasons which might account for this and the existence of which could be ascertained are: Unsupervised teachers give greater emphasis to the three R's than teachers in supervised districts. Attendance in the sixth grade in unsupervised districts is poorer on the part of mentally backward or scholastically below normal children than in supervised districts. The qualifications of teachers in unsupervised counties are higher than in supervised counties.

Washington Junior High School of Rochester, New York, has recently supplied us with a considerable amount of material dealing with their social program. One of their bulletins is on clubs. It lists the most extensive series of clubs which we have found in connection with any single school. Apparently these clubs work vitally toward one or more of at least six of the seven main objectives of secondary education set forth by the National Committee on the Reorganization of Secondary Education.

Sample programs of club meetings evidence the fact that much emphasis is being placed on these social adjustment fields. It is noteworthy also that the school report cards give a standing not only in scholarship, but also in service and character, as shown by self-control, reliability, cooperation, courtesy, and participation in school activities.

Seven school baths are now being operated by the Public Bath Commission, in cooperation with the Board of School Commissioners. Plans for all new schools call for adequate bathing facilities.

The school baths are most successful where they are looked upon by the pupils as part of a physical education program, rather than merely as a cleanliness proposition. The boy who can see physical exercise in his "bath and rub-down," who can stand "a little cold water" without flinching and who realizes that the athlete who is "in the pink of condition" gets that way by tonic bathing as well as by vigorous exercise, is certain to take more kindly to the bath period. —*Baltimore Bulletin of Education.*

The subject of the American Legion National Essay Contest which is open from May 25 to October 12, 1923, is "Why America Should Prohibit Immigration for Five Years." Boys and girls between the ages of 12 and 18, inclusive, are eligible to enter this contest. The essays are not to be over 500 words in length.

The American Legion National Scholarship prizes are as follows: First prize, $750; Second prize, $500; Third prize, $250. First prize in each State will be a silver medal; second prize, a bronze medal; third prize, a Certificate of Merit issued by the National Headquarters of the Legion.

The cash prizes will be used only toward scholarships in colleges designated by the winners.

Full details in regard to the contest may be secured by writing to The National Americanism Commission, The American Legion, Indianapolis, Indiana.

An examination of approximately two thousand button holes submitted by schools in various parts of the United States for an analysis of fourteen textbook demonstrations for making button holes reveals a curious lack of agreement upon the essential element of a satisfactory button hole. A chart for diagnosing defects in button holes has been issued by the Bureau of Educational Measurements and Standards, Kansas State Normal School, Emporia, Kansas. It seems that there are at least eight qualifications for a good button hole upon which teachers agree to a fair extent. These ideas are illustrated on the chart, and experimental evidence proves that this chart placed in the hands of the children or used by the teacher as a teaching device results in marked improvement. This represents another analysis in a general field with a resulting chart designed to aid in securing desirable results in a more restricted area.

The tenth annual schoolmen's week in the University of Pennsylvania last spring was the greatest in its history. The total registration on the final day of the conference was 2,930. Among the speakers on the program were: Governor Pinchot; State Superintendent Finegan; Dr. Russell H. Conwell; Provost Josiah H. Penniman; Dr. B. T. Baldwin, State University of Iowa; Dr. J. E. Butterworth, Cornell University; Dr. M. B. Hillegas, Teachers' College, Columbia University; Dr. H. O. Rugg, Lincoln School, New York City; Dr. George A. Walk, Temple University; President Frank Aydelotte of Swarthmore College and Dean G. H. Reavis, University of Pittsburgh.

The topics discussed were: The state financial program; Rearrangement

of school districts; Grouping by abilities in elementary and secondary schools; State program for teacher training; The junior high school; Extension teaching; Vocational guidance; Health education; and Teaching of social studies.

The Boston Department of Educational Investigation and Measurement reports in mimeographed form the results of tests in United States history given in June, 1922. The tests were devised by Miss Olivia C. Penell, Research Assistant for work in grades VI, VII, and VIII. Separate tests were devised for each of the three grades, with common material on the period of discovery and exploration. The conclusions based on the results in Boston are that pupils in these grades show no marked differences in their ability to recall the answers needed in these exercises. A confusion existed as to the meaning of the words "explorer" and "discoverer." Certain individuals were confused with others or associated with wrong events or places. Pupils were not familiar with the various documents of our country, being unable to recognize extracts from the Declaration of Independence, the Constitution, and the Monroe Doctrine. Pupils have formed the practice of referring to anniversaries and holidays by their dates rather than by their proper names. They are not conversant with the important questions of the day.

A brief report on classification in the Kansas City Central Junior High School states that pupils were classified on the basis of tests, scales, teachers, standards of ability, and teachers' marks. After enrollment, the Otis test was given and some months later the Terman group test. Correlation of scores between "National" and "Otis self-administering" among the 371 pupils was .73. Between schools on Terman and Otis self-administering, 776 pupils, the correlation was .77.

Miss Elizabeth P. Wilson, educational counselor, hits a fundamental thought, however, with regard to classification and educational problems, in these sentences. "While pupil classification has proved to be an excellent teaching device, it does relatively little for the pupils unless methods and subject matter are adapted to the needs of the various groups. Our most insistent problem now is the modification of the course of study in English, Geometry, and Ancient History for the bright and dull groups."

We should be very glad indeed to give publicity in this department to curricular modifications which are in actual use in schools and which have attacked the problem of differentiated work for students classified on the basis of mental ability.

Wisconsin's so-called State Board of Education has been abolished. It never was a real State Board of Education in the sense that students of education have in mind when they include such an organization in their ideal form of state administration. In the following statement issued by the Board after its demise there is, therefore, a certain sophistry: "Every important discussion of State educational administration, every recognized authority on public education in the country, and every investigation of a State educational system includes as the primary recommendation in the

proposed reorganization of educational systems the placing of a State Board of Education at its head. As a matter of actual practice boards of education are being placed in charge of State school systems."

We think it unlikely that recognized authorities have ever had in mind a State Board of Education such as was created in Wisconsin in 1915; and we are certain that they have never thought of such an organization as that which Wisconsin's State Board of Education came to be through the act of the 1917 legislature.

On the other hand, we are quite prepared to believe that the statement of the State Board of Education is entirely correct in representing "that educational reasons were not controlling in the abolition of the State Board of Education." We may be quite certain that the considerations which actuated the legislature and the governor had little to do with the merits of the case.

"The Spelling of English by Porto Rican Pupils," Bulletin No. 1 of the University of Porto Rico, was written by Charles W. St. John, dean of the University. The study grew out of the writer's recognition of certain persistent errors in spelling on examination papers. Material was secured from pupils in 44 eighth grades in the form of compositions in English entitled, "How I Spent My Christmas Vacation." There were 1,131 composition papers totaling about 200,000 running words in which exactly 1,000 different words were misspelled a total of 3,890 times. Errors in capitalization were not considered spelling errors. The first twenty most frequently misspelled words were as follows: these, then, Christmas, feast, vacation, where, automobile, studying, friend, night, there, and, beginning, dance, feel, too, Christ, December, this.

Six of these words doubtless had the high frequency due to the special topic of the composition. Confusion of words produced a large number of errors; for example, these and this; then and them; passed and past; where and were; too, two, and to; there and their; custom and costume; bathe, bath, breathe and breath; feel and fill; think, thing, and sing; went and when; not and no; country and county. The writer concludes that (1) the confusion of English words is more properly a matter of spelling—not merely of general vocabulary—than the phrase suggests, for there were very few cases where the pupils' ideas were confused as to the distinctions of meaning; (2) probably two-thirds of all the errors listed are quite directly the result of the language situation in Porto Rico—Spanish being the mother tongue, and English usage and pronunciation, of course, bearing a distinct influence from Spanish and the local pronunciation of Spanish. The bulletin contains also suggestions on method of instruction, comparison of individual and group scores, and errors in English grammar in Porto Rico. It is an interesting study carefully done and should be suggestive to teachers in any community in which the native language is not English.

The Stanford Achievement Test, issued recently by the World Book Company, is the farthest advance yet made in the direction of organizing tests into "batteries." The authors are Truman L. Kelley, Giles M. Ruch,

and Lewis M. Terman. Two batteries are provided, each with duplicate forms. The first is called the Primary Examination. It comprises three reading tests (paragraph, sentence, and word meaning), two arithmetic tests (computation and reasoning), and a spelling test in the form of a dictation exercise. The second is called the Advanced Examination. Besides tests of the same kind as appear in the Primary Examination, it provides additional tests in nature study and science, history and literature, and language usage. The value of these tests will be apparent to anyone who examines them. The scores are handled by converting them into age scores for each test. These are then merged into an educational age.

Much work has been done by the authors in securing reliable instruments. The two forms of the test have been correlated for each age from seven to fifteen. These correlations are the reliability coefficients appertaining to the tests for the ages in question. Most of the coefficients are above 90. The probable errors of the educational ages have likewise been worked out. These amount only to one or two months. In other words, even for the ages where probable errors are among the highest, the chances are even that an educational age as obtained will not be in error more than two months.

The time required for giving the tests is rather long. It is not, however, in our judgment longer than it ought to be. We cannot expect to test children adequately unless we give them time to evince their degree of ability.

The teacher's manual is equipped with tables by means of which scores may be converted without computation into age equivalents. Although the authors give grade norms as well as age norms, they greatly prefer the latter. We are inclined to believe that they minimize even the theoretical importance of grade equivalents, and we are sure that they are overlooking their practical importance.

The Ohio State University Contributions in Psychology, No. 1, contains a report of the university intelligence tests for the years 1919-22. Each year all new entrants to the university are required to take an intelligence test. The Army Alpha was used originally, and later tests have been revisions of this scale. On the basis of results for three years it is concluded that these tests can render distinct service in a number of administrative and educational problems. Minor revisions will be made from year to year but in their present form they may be used to advantage in the following cases:

1. In determining the amount of work which certain students should be permitted to carry.
2. In determining the amount of outside work which certain students should be permitted to assume.
3. In helping to decide the question of dismissal or suspension of any student.
4. In determining the reinstatement of suspended students.
5. In solving the problems connected with probationary and morally delinquent students.
6. In determining the admission of students to certain advanced courses, in which native ability is as important a requirement as any fixed academic prerequisite.

7. In giving vocational advice to students, and in recommendations for academic and industrial positions. The intelligence ratings are especially valuable in recommendations to scholarship committees and in the appointment of assistants.
8. In admitting to the University students who have not satisfied the conventional entrance requirements. Intelligence tests may be substituted for or may be supplementary to the usual entrance requirements.
9. In classifying students for instructional purposes into groups of approximately equal ability. The superior students could thus progress faster, and the inferior students could be given more careful instruction. The necessity for a method of getting better academic work from the more competent students has already been pointed out. Every student should be working near the limit of his native endowment.

The report of the National Committee on Mathematical Requirements on *The Reorganization of Mathematics in Secondary Education* is a volume of 650 pages much of which ought to be of the greatest interest to mathematics teachers everywhere. A review of this report will appear in a later issue of the JOURNAL.

The Latin Vocabulary Test prepared by Mr. P. R. Stevenson of the Bureau of Educational Research, Ohio State University, has been given to several thousand Latin pupils in different parts of the United States. As a result of this preliminary investigation three forms of the test, approximately equal in difficulty have been prepared. The items in each form of the test are arranged in increasing difficulty from the first to the last.

Each page of the test carries a column of English words arranged alphabetically and a column of Latin words. Each English word is numbered while an empty parenthesis stands opposite the Latin word. The pupil is instructed to find the English word which gives the meaning of a Latin word and write the number within the parenthesis opposite the Latin word.

This Latin test is now ready for the establishment of the final norms. Test forms will be provided free, as long as the edition lasts, to teachers who are interested to cooperate in this project.

A Committee of the Schoolmasters' Club of Dayton, Ohio, submitted a questionnaire to the seniors in the local high schools to determine their attitude toward teaching as a profession. Only six of the 134 boys stated that they expected to enter teaching—37 gave low salary as the reason for not doing so; 44 stated that they had made other choices; 19, that they disliked the work; 16, that they were lacking in fitness; 16, that there was a lack of future in teaching; while 26 stated simply that they were not interested. When asked if they considered teaching of as great importance to society as various other lines of work—law, medicine, dentistry, ministry, commerce, industry, agriculture, and engineering—the boys in both schools

gave a majority vote in the affirmative. There were considerable numbers in each case who voted negatively. To the question, "Do you respect teaching as a man's work?" the affirmative vote was four to one. A somewhat similar questionnaire sent to the senior girls by a committee of The Teachers' Club revealed the following answers: eighty-seven stated that they were considering or interested in teaching as a profession; 115 stated definitely that they were not; while 47 said "not seriously." To the question, "Why do you favor teaching?" 22 said that it appealed to them; 11, that it afforded opportunity for development; 23, that they loved children; 8, that it afforded a chance to do good; 8, short hours; and 19, that it was a profession of high standing. In response to "What are your objections to teaching as a profession?" 20 stated that they had none; 80, that it lacked appeal; 25, that they themselves did not have the ability; 4, there was a lack of appreciation shown to the teacher; 7, that it produced too much nerve strain; 10, that there were more opportunities in the business world; and 6, that it was too narrowing.

The World Conference on Education

The most significant thing about the World Conference on Education which met in San Francisco last July, was not the program set up or the tangible results accomplished, but the spirit which was manifested by the delegates. Those who attended feel that it is unquestionably one of the greatest events in the history of education. It was called under the auspices of our National Education Association but the idea was undoubtedly helped and encouraged by the meeting of the Pan-Pacific Union two years ago.

Direct credit for the success of the conference is due to Dr. Augustus Thomas, Chairman of the Committee on Foreign Relations of the N. E. A. Others to whom credit should be given were: President N. D. Showalter of the State Normal School of Cheney, Washington, Dr. Arthur W. Dunn, Director of the American Junior Red Cross, Washington, D. C., Dr. Thomas D. Wood of Teachers' College Columbia University, Mrs. Cora Wilson Stewart, Chairman of the Illiteracy Commission of the N. E. A., Professor Edward O. Sisson of Reed College, Portland, Oregon, Dr. Frank F. Bunker, Secretary of the Pan-Pacific Union, Honolulu, and Professor James S. Hosic, Director of the Extra Mural Courses of Teachers' College, Columbia University.

Perhaps Professor Sisson's characterization of the conference will give a better idea of it than can be given in any other way. He said:

"The biggest thing about the world conference on education was the conference itself. There never was, anywhere, at any previous time in known history a conference even remotely resembling this one. Yet it is the most natural thing in the world that there should be such a conference. Half a hundred separate nations were ready for it. Delegates came round the globe to bring contributions and carry away its fruits.

"The conference is just another embodiment of the great spirit of the times that is drawing mankind together. It is a great wave in the rising

tide, not of color, but of common humanity. And the tide of common humanity is the consummation of all the past and the hope for all the future.

"Rash predictions were conspicuous by their absence. The conference did not pretend to know whether or not the next great war would happen. Instead it was intensely busy with every plan and device to be used in the immense task of organizing peace in the hearts of men through the agency of the schools of all nations. I know of nothing more sensible and practical in the world than that."

Among the resolutions adopted by the conference were:

1. On the removal of illiteracy, which provided that a national commission of illiteracy be appointed, consisting of representatives from every nation, who would work for the removal of illiteracy from all countries as soon as possible.

2. That the world conference on education should undertake the organization of a permanent bureau of research to investigate the various phases of educational development in the different countries; to publish an international digest of education; and to furnish information concerning publications so as to facilitate research work.

3. That an educational attaché be provided for each embassy or legation who shall be a recognized educational expert of the highest rank.

4. That a universal library bureau be established to supply to any nation upon request books, pamphlets, and magazines for use upon any subject.

5. That the world conference on education should take steps toward the establishment of a world university composed of a student body and faculty from every possible nation, race, and country, for the special purpose of studying inter-racial and international questions and the relation of education thereto.

A Modification of the Short Method for Finding the Standard Deviation of a Distribution of Measures

A standard principle among research workers is that all results should be carefully checked for accuracy. Whenever it is possible the same results should be found by another method for it is difficult to detect one's own errors. Thus far there has been no widely accepted process for checking on the results produced by the so-called short method for finding the standard deviation, as it is given in textbooks on statistical methods. Perhaps this fact has contributed in part to the observation that many students in education have turned to the free use of the quartile deviation as a measure of variability. This tendency is unfortunate for the cause of educational research, for the best thing which can be said for the quartile deviation is that it is easy to find. In reality it is not a valid measure of variability at all in comparison with the significant and comprehensive facts revealed by finding the value of the standard deviation.

A search through the literature on standard deviation reveals no "royal road" to its determination. A modification of the usual short method for finding it is, however, here presented for what it may be worth to the readers of this JOURNAL.

The inception of this paper dates back to the March 1920 issue of the JOURNAL OF EDUCATIONAL RESEARCH. In that issue there appeared an article by Dr. Leonard P. Ayres entitled, "A Shorter Method for Computing the Coefficient of Correlation." In the closing paragraph of this article the author states, "The use of the theorem that the sum of the squares of the deviations of a series of items away from their average is equal to the sum of the squares of the items minus the product of the total of the series and its average will greatly facilitate the finding of the standard deviation."

In the following June number the editor, Dr. B. R. Buckingham, replied to a number of inquiries as to the proof of Doctor Ayres' method described in the March issue. Among other things the editor said, "What Doctor Ayres has done, in effect, is to assume an average at zero for both the subject and relative series. The correction or difference between the assumed average and the true average then becomes the true average itself."

Working from the suggestions given in the above quotations the writer sought to apply the principles to finding the standard deviation when that measure alone is wanted.

The theorem as given by Doctor Ayres is more readily appreciated if it is translated into a formula such as the following:

$\Sigma d^2 = (m_1^2 + m_2^2 + m_3^2, \ldots m_n^2) - (m_1 + m_2 + m_3 + \ldots m_n)\ (Ave)$, in which

$\Sigma =$ the sum of the series

$d =$ the deviation of each item away from the average item

$m =$ the items each considered separately

$Ave =$ the average of the series of items.

Since the formula for the standard deviation is $\sqrt{\frac{\Sigma d^2}{n}}$, all that remains necessary to convert the result of the computation derived from the use of the above formula is a division of it by the number of items, and the extraction of the square root of the quotient. The desired variability is thus found without finding a single actual deviation as in the usual detailed method. What has actually occurred, however, is explained by the statement of Doctor Buckingham. The average of the series has been assumed at zero, and the items themselves become the deviations when the deviations are calculated from it. In such an instance the sum of the squares of the items is in excess at the maximum, and a correction is necessary. The correction is found in the product of the sum of the series and its average. When the average is assumed at some point within the series the necessary correction is usually less.

The value of this formula is more apparent when it is compared with the usual short method in a very simple illustration. Suppose that in a class of twenty pupils the scores on a percentage basis were distributed in the following manner: 75, 73, 80, 85, 90, 76, 81, 86, 94, 77, 82, 87, 78, 83, 88, 79, 84, 80, 80, 82. If these scores be tabulated into class-intervals of five points each the results are shown in the first two columns below. The standard deviation is then calculated in the usual manner. No explanation is given, for the necessary information as to method is explained in any standard textbook on the subject. The illustration in Table I is given for comparative purposes.

TABLE I

m (1)	f (2)	d (3)	fd (4)	fd^2 (5)	By check method: d (6)	fd (7)	fd^2 (8)
70—74.9	1	−2	−2	4	1	1	1
75—79.9	5	−1	−5	5	2	10	20
80—84.9	8	0			3	24	72
85—89.9	4	1	4	4	4	16	64
90—94.9	2	2	4	8	5	10	50
Totals	20			21		61	207

$\sigma^2 = 1.0475$; $\sigma = 1.023$; $1.023 \times 5 = 5.12$ the standard deviation in terms of scores.

The last three columns are the ones which are used for checking purposes. The number 207 represents the sum of the deviations from the assumed average at zero after each has been squared. The number 61 represents the sum of the deviations from the same assumed average. In each instance these sums have been increased through the weighting by the frequencies in the usual way. The 207 is the number found by the first part of the formula to the right of the equation sign; the 61 is the second quantity; the only part lacking is the average. This is found by dividing 61 by the number of cases, 20, which gives, 3.05. This last number is the average of the deviations from zero as measured in steps of five units each. Multiplying 61 by 3.05 the necessary correction is found which is 186.05. Making the subtraction indicated in the formula the remainder is 20.95.

As stated above, all that remains in order to convert this number into the standard deviation is to divide by the number of cases and extract the square root. Dividing 20.95 by 20 gives 1.0475 which evidently checks with the σ^2 found by the usual short method.

All the work in the checking process can readily be done mentally. When the distribution is long the consecutive numbers at the end of the deviations may run into two place figures. Unless the distribution is asymmetrical, however, the effect is not noticeable. In case the numbers are large in both columns, referring to columns (6) and (7) above, a calculating table eliminates the inconvenience. Crelle's calculating tables are found in most libraries.

The true average of the distribution of scores may be found with the numbers already used in the checking process. The average of the weighted deviations in steps is multiplied by the number of actual units in a class interval, and added to the zero point of the given distribution. In the distribution given above the zero point is at 67.50, for this point is just an even step below the first deviating point. Applied to the illustration above: $3.05 \times 5 = 15.25$; $67.50 + 15.25 = 82.75$, the true average score for the whole class.

With skill in the use of the proposed method it may be used direct instead of for checking purposes. A glance at the distribution will indicate which is the shortest method to use for direct work.

University of Pittsburgh STUBGISS BROWN DAVIS

OHIO STATE UNIVERSITY
COLLEGE of EDUCATION

Announcements for the Autumm Quarter

REGISTRATION

Instruction for the Autumn Quarter will begin Monday, October 1. New students may register by mail or in person at any time before that date. Under the quarter system, students may enter at the beginning or leave at the close, of any quarter. Students may register, for any quarter, during the quarter immediately preceding. Dates of the Autumn, Winter, and Spring Quarters for 1923-24 are as follows:

Autumn Quarter, October 1 to December 22, 1923.
Winter Quarter, January 2 to March 15, 1924.
Spring Quarter, March 24 to June 10, 1924.

AUGMENTED FACULTY

The College of Education has made substantial additions to its faculty for 1923-24. These include ten new teaching members exclusive of extra personnel serving in the Summer Quarter only. These acquisitions enable the College to offer a more diversified list of courses.

CURRICULA

The College of Education offers general curricula for the preparation of public school teachers of all the standard academic subjects. It also offers special curricula in Fine Arts, Home Economics, and Industrial Education (including Manual Training.)

NEW CURRICULA

Beginning with 1923-24, the College of Education offers new curricula as follows:

Curriculum in Vocational Education
" " Physical Education
" for Commerical Teachers
" " Teachers, Supervisors, and Principals in Elementary Schools.
" " School Nurses and Teachers in Schools of Nursing.

DEGREES AND CERTIFICATES

All of the above mentioned curricula require four years for completion and lead to the degree, Bachelor of Science in Education, and the appropriate state certificate or certificates.

OTHER SPECIAL FEATURES

Appointment Committee, Psychological Clinic, Bureau of Educational Research, Quarter System, new Division of Elementary and Rural Education.

OPPORTUNITIES FOR GRADUATE WORK

Facilities for graduate work in Education have been considerably enlarged, as evidenced by the fact that the professional departments of the college will offer during the Autumn Quarter a total of 46 courses open for graduate credit. In addition to classroom courses, good opportunities for directed individual study and research are now made available by the departments of History of Education, Principles and Practice of Education, Psychology, School Administration, and Vocational Education. In this connection graduate students will find the Bureau of Educational Research a valuable source of help.

For additional information address

College of Education OHIO STATE UNIVERSITY
Columbus, Ohio

N

. New
Under
lose, of
imme-
1923-24

ulty for
rsonnel
to offer

public
curric-
Manual

cula as

chools.

on and
e state

al Re-

arged,
l offer
In ad-
ly and
cation,
nd Vo-
eau of

SITY